# Western Rivers Performance Plan for Marine Safety & Environmental Protection 2000







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United States Coast Guard

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To: Commander, Eighth Coast Guard District (m)

Subj: WESTERN RIVERS PERFORMANCE PLAN FOR MARINE SAFETY & ENVIRONMENTAL PROTECTION

1. Enclosed is the Western Rivers Performance Plan for Marine Safety and Environmental Protection. This plan was jointly developed by executive officers from each of the six Western River MSOs. The purpose of the plan is to align the goals, strategies, activities and measures of Western River MSOs with those found in the Coast Guard's Annual Performance Plan, G-M's FY 2000-2004 Performance Plan for Marine Safety and Environmental Protection, and the Eighth Coast Guard District's Tactical Performance Plan.

2. Our intent in developing this plan is to promote and ensure consistency among the six Western River MSOs and provide a means of tracking mission performance. This plan will save time by reducing the duplication of effort in developing and updating unit performance plans. It also provides the flexibility for each MSO to address its own unique aspects by developing unit specific "strands" to this "core" performance plan.

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Encl: (1) Western Rivers Performance Plan for Marine Safety & Environmental Protection

# Western Rivers Performance Plan for Marine Safety & Environmental Protection

## Preamble

## Overview of Plan

| | |
|---|---|
| **Purpose** | To align the goals, strategies, activities, and measures of the Marine Safety Offices (MSO) located on the Western Rivers (WR) of the Eighth Coast Guard District. |
| **References** | (a) Coast Guard Annual Performance Plan, COMDTINST 16010.8<br>(b) FY 2000-2004 Performance Plan for Marine Safety and Environmental Protection<br>(c) Eighth Coast Guard District Tactical Performance Plan (TPP), CGD8NOTE 16000 |
| **Members** | • MSO Pittsburgh<br>• MSO Huntington<br>• MSO Louisville<br>• MSO Paducah<br>• MSO St. Louis<br>• MSO Memphis |
| **Vision** | Partnering with other MSO's and industry to meet the challenges faced by the Western Rivers in the new millennium. |
| **Mission** | Our mission is to promote the safe marine transportation of people and cargo, safeguard those who use our waterways, and protect the marine environment from pollutants. |
| **Core Values** | Honor, Respect, and Devotion to Duty. |
| **Guiding Principles** | Consistency, Teamwork, Vision, and People. |

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## Overview of Plan, Continued

**Discussion**

This performance plan was jointly developed by the six MSOs located on the Western Rivers to align the goals, strategies, activities, and measures with those found in references (a) through (c). This plan also addresses the missions, programs, and challenges that are common to these Western River units, i.e. Cooperative Towing Vessel Examination Program (CTVEP), high capacity passenger vessel (HCPV) safety, spills & recovery of pollutants in a river environment, etc. Each unit may also address its own unique aspects by developing unit specific "strands" to this "core" Western Rivers performance plan. The implementation of this "Core & Strand" approach to the development of unit performance plans will:

- Ensure consistency in approach to mission performance.
- Provide each MSO the ability to "benchmark" their performance with other Marine Safety Offices located on the Western Rivers.
- Promote the free flow of "Best Business Practices" among WR MSOs.
- Promote the use of Baldridge/CQA criteria.
- Permit each MSO the ability to address issues unique to their zone or unit using the "Strand" approach.
- Eliminate duplication of effort in the development and update of unit performance plans.

For the sake of brevity, the strategies and activities for accomplishing the various WR MSO performance goals are consolidated in a matrix beginning on page 16.

**Updating the Plan**

Unit Executive Officers will ensure this plan is updated annually by the end of the third quarter of each fiscal year (June 30). A natural work group (NWG) approach is encouraged and should involve in-person meetings between the Executive Officers.

To facilitate future updates to this plan, two things have been done:

- Formatting Solutions™ software has been used to format this document according to the principles of the Information Mapping method of structured writing.
- Background verbiage has been kept to a minimum since much of the rationale & key business drivers for this plan and its goals are already thoroughly addressed in references (a) through (c). We hope the reader will appreciate our attempt to be as brief as possible.

# Table of Contents

# Alignment of Strategic Goals

**Strategic Goal Alignment**

Figure 1 below illustrates how the strategic goals of Western River MSOs are aligned with the strategic goals of the Eighth District, Commandant, and the Department of Transportation. A more in-depth description of the alignment of strategic goals can be found in references (a) through (c).

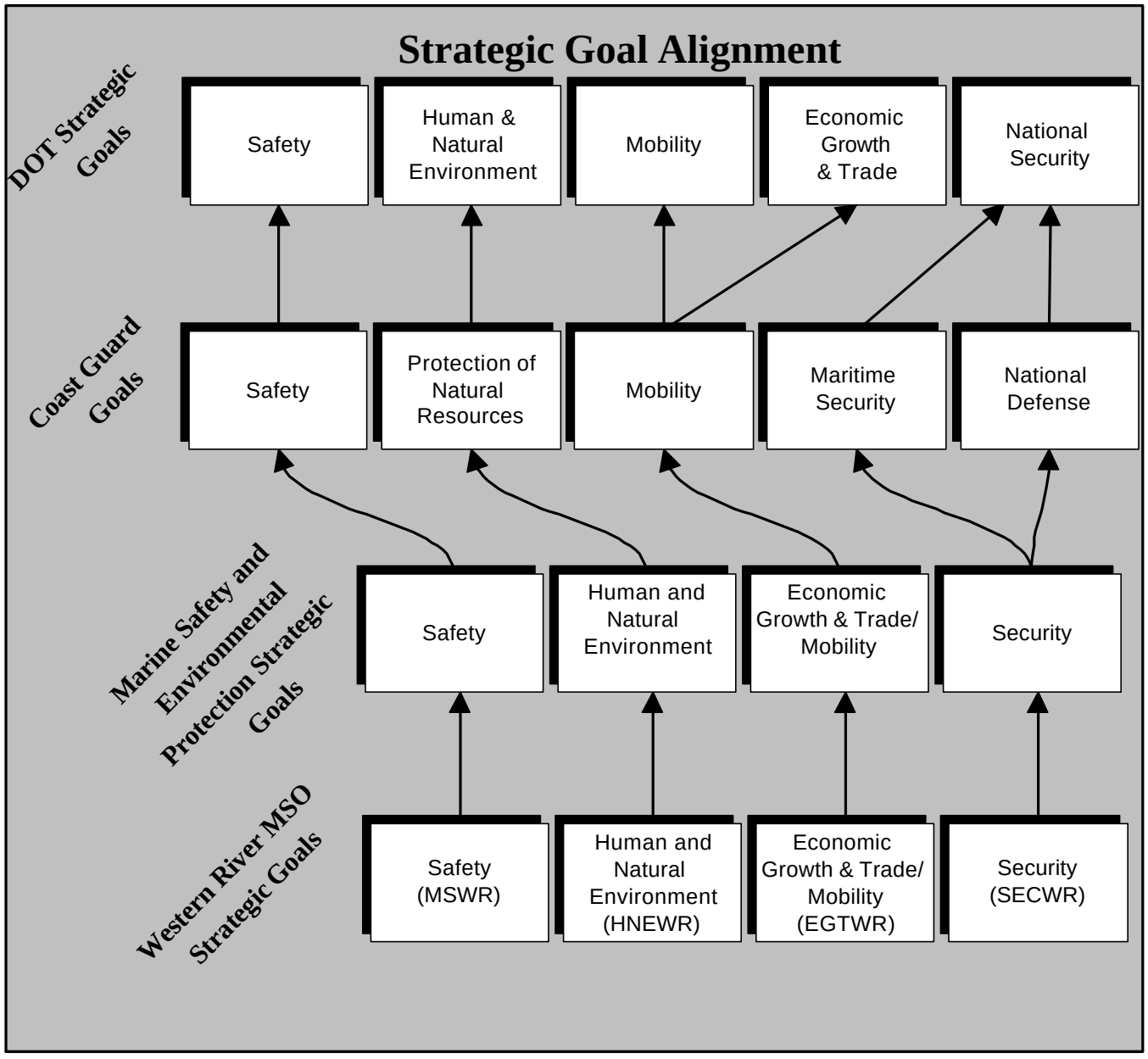



**Figure 1**

# Mission Goals

## Safety

**Strategic Goal**

Eliminate deaths, injuries and property damage associated with commercial maritime operations.

**Performance Goal MSWR-1**

Reduce the crewmember casualty rate by 45% from the 1998 statistical baseline of 1.91 casualties per 1,000 workers to 1.05 casualties per 1,000 workers by 2003. This is shown in Figure 2 below.

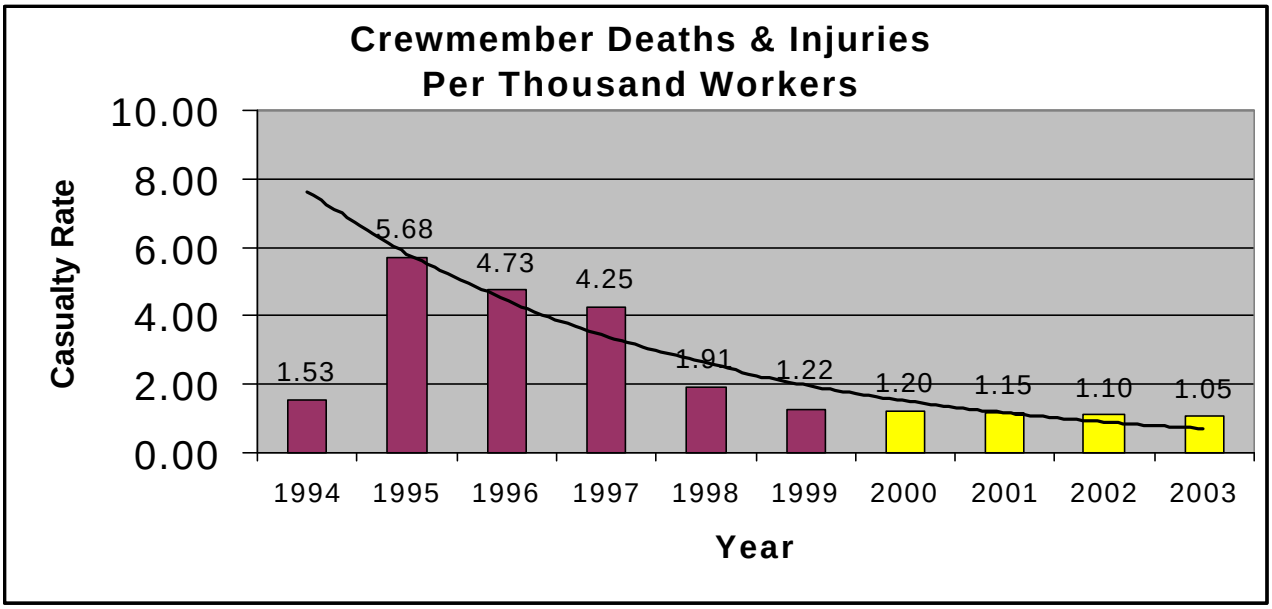



**Figure 2**

**Comments**

Appendixes 1a through 1c contain the raw data that was used to construct Figure 2. The tables in Appendixes 1a and 1b show crewmember deaths and injuries for each WR MSO and their detachments for the years 1994-1999. The data was obtained from G-M's Mission Analysis and Planning (MAP) application on the Coast Guard intranet.[1] The employment and passenger data for U.S. water transportation was obtained from McGraw-Hill's U.S. Industry and Trade Outlook 1998. The data indicates a steady decline in the casualty rate over the last five years, which is consistent with the G-M Performance Plan. On average, the WR region sees about 5 deaths per year.

*Continued on next page*

[1] http://mslwebi2.osc.uscg.mil/sasweb/uscg/uscg_frame.html

**Performance Goal MSWR-2**

Reduce the passenger casualty rate by 21% from the 1998 statistical baseline of .56 casualties per million passengers to .44 casualties per million passengers by 2003.[2] This is shown in Figure 3 below.

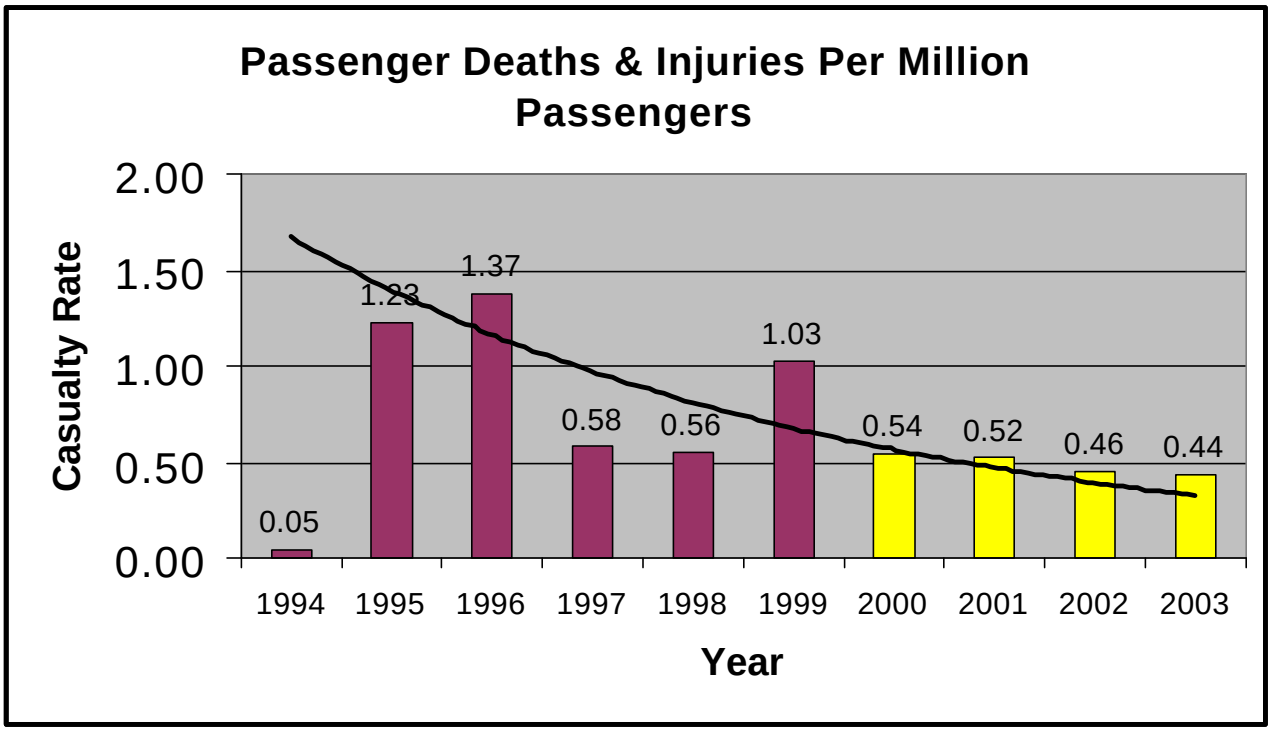



**Figure 3**

**Comments**

Appendixes 2a through 2c contain the raw data that was used to construct Figure 3. The tables in Appendixes 2a and 2b show passenger deaths and injuries for each WR MSO and their detachments for the years 1994-1999. The data was obtained from the same sources used to illustrate goal MSWR-1. The data indicates a 64% decline in passenger injuries since 1995. The median number of passenger injuries over the last 5 years is 8. Unfortunately, the data also indicates a 133% increase in passenger deaths since 1995. This is due to 13 deaths that occurred when the MISS MAJESTIC sank at Lake Hamilton, Hot Springs, AR. If this casualty is treated as an outlying event, then the median number of passenger deaths since 1994 is only 2.

[2] The MSWR-2 goal excludes injuries & deaths occurring on permanently moored passenger vessels.

# Security

| | |
|---|---|
| **Strategic Goal** | Eliminate marine transportation and river security vulnerability. |
| **Performance Goal SECWR-1** | Reduce the risk to marine transportation related (MTR) waterfront facilities posed by intentional criminal or terrorist acts so that 75% of vital facilities are rated no higher than medium risk by 2003. |
| **Comments** | Each WR MSO zone includes numerous MTR facilities, many of which transfer or store significant amounts of hazardous materials, including explosives, compressed gases, flammable liquids & solids, oxidizers, poisons, and corrosives. Some of these facilities could be attractive targets for criminal or terrorist interests.<br><br>The actual risk level of a particular facility is based on three main factors: (1) the vulnerability of the facility to an intentional act to destroy or damage it, (2) real or anticipated threats faced by the facility, and (3) the consequences that would arise if the facility was destroyed or damaged. Many circumstances must be considered when determining the risk level of a facility, including: types/amounts of hazardous materials handled, proximity to people and transportation routes, existing physical security controls, potential environmental impact posed by a catastrophic release, and potential economic impact of a damaged facility. MSO Louisville is developing and implementing an MTR facility physical security survey tool to assist in identifying high-risk facilities. This survey tool is based in part on the physical security survey form found in Vol. VII of the Marine Safety Manual, COMDTINST M16000.12. Once completed, this tool will be distributed for voluntary use among WR MSOs. The goal is to identify MTR facilities that are considered vital to the public interest (in terms of safety, environmental, and economic impact) and then work toward helping these facilities to reduce their risk levels.<br><br>A measurement system to support this goal will be in place by mid-2001. Actual field surveys of MTR facilities will be conducted by reserve Port Security (PS) Specialists with assistance from regular/reserve MTR facility inspectors. |

# Human and Natural Environment

**Strategic Goal**

Eliminate environmental damage associated with maritime transportation and operations on and around the nation's waterways.

**Performance Goal HNEWR-1**

Reduce annual volume of oil pollution from maritime sources in the Western Rivers to no more than 1.6 gallons spilled per kilo-ton shipped by 2003. This is shown in Figure 4 below.

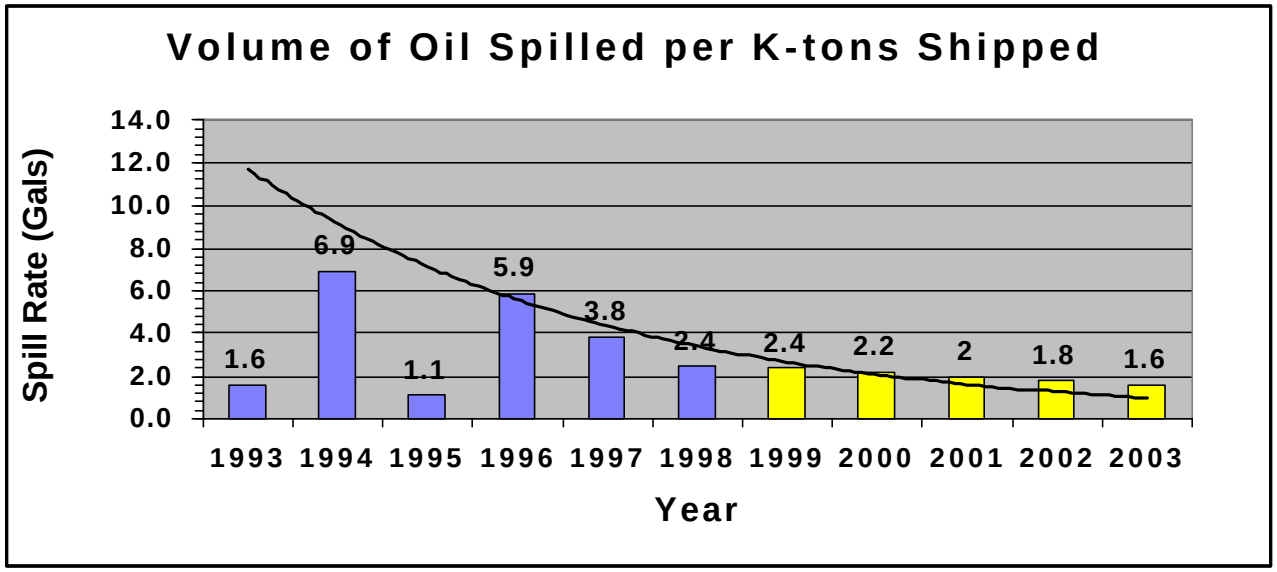



**Figure 4**

**Comments**

Appendix 3a contains the raw data that was used to construct Figure 4. The table in the appendix shows spill volume (in gallons) for each WR MSO for the years 1993-1998. The data was obtained from G-MOA's Standard View database.[3] The data on tonnage of petroleum products shipped was obtained from annual reports produced by the U.S. Army Corps of Engineers (USACE) entitled Waterborne Commerce of the United States, Part 2- Waterways & Harbors Gulf Coast, Mississippi River System and Antilles.[4] The decreasing trend in spill rate is consistent with the national trend shown in the G-M Performance Plan. Over a six-year period, maritime sources in the Western Rivers region spilled approximately 436,811 gallons of oil. The average total volume spilled per year was 72,800 gallons.

*Continued on next page*

[3] Commandant (G-MOA), http://cgweb.uscg.mil/g-m/hq/g-mo/moa/standard.htm
[4] ACOE Waterborne Commerce Statistics Center, http://www.wrsc.usace.army.mil/ndc/wcsc.htm

**Performance Goal HNEWR-2**

Reduce the number of medium and major oil & hazardous material spills from maritime sources in the Western Rivers to an annual moving average rate of no more than .145 medium or major spills per million tons shipped by 2003. This is shown in Figure 5 below.

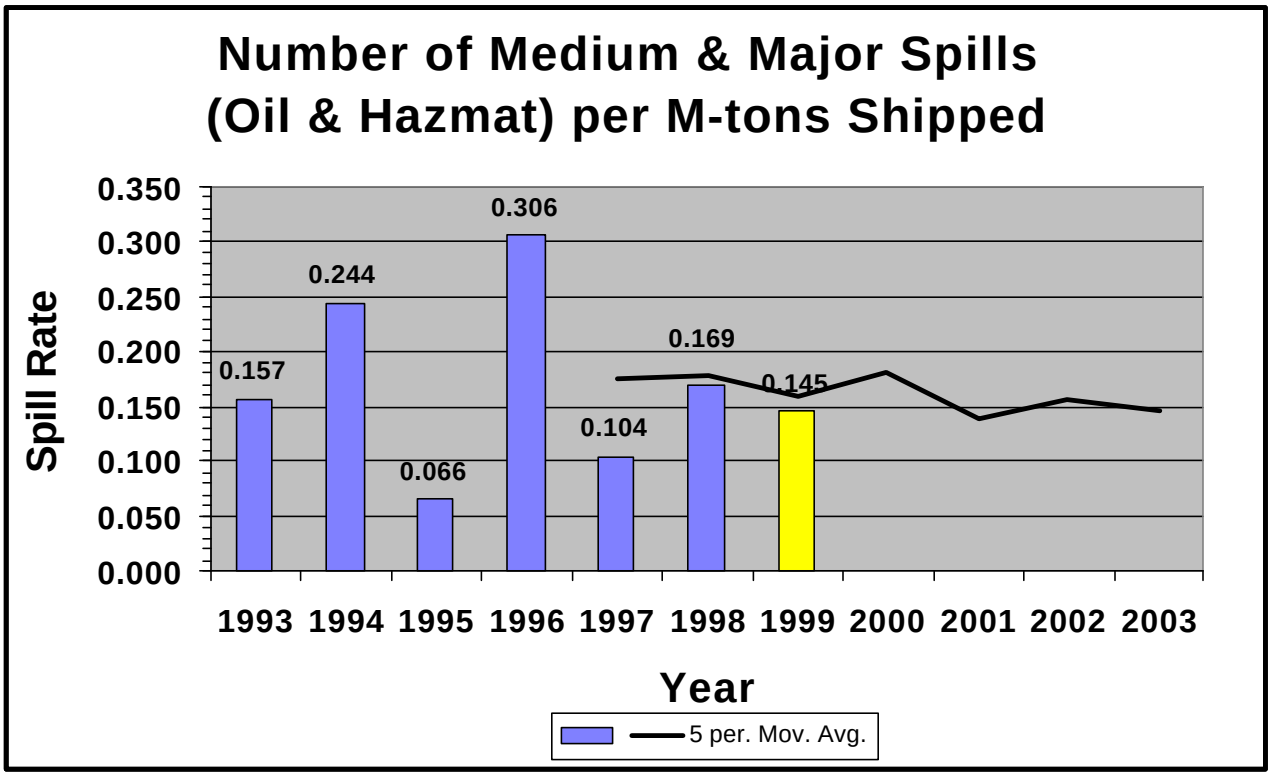



**Figure 5**

**Comments**

Appendix 3b contains the raw data that was used to construct Figure 5. The table in the appendix shows a count of spill severity (minor, medium, & major) for each WR MSO for the years 1993-1998. The data was obtained from the same sources used to illustrate goal HNEWR-1. A five-period moving average was used to construct the trend line as the data did not appear to follow an inverse exponential function as predicted in the G-M Performance Plan. A moving average provides trend information that a simple average of data would mask. The spill rate for the year 1999, shown in yellow in Figure 5, is an estimate based on available data. On average, the Western Rivers region experiences 7 medium & major spills of oil and hazardous materials per year.

# Economic Growth & Trade/Mobility

**Strategic Goal** Maximize the availability of safe, efficient, and environmentally sound waterways for all users by eliminating interruptions and impediments that restrict the economical movement of goods and people.

**Performance Goal EGTWR-1** Reduce the number and duration of unplanned river closures and restrictions per million tons of cargo shipped.

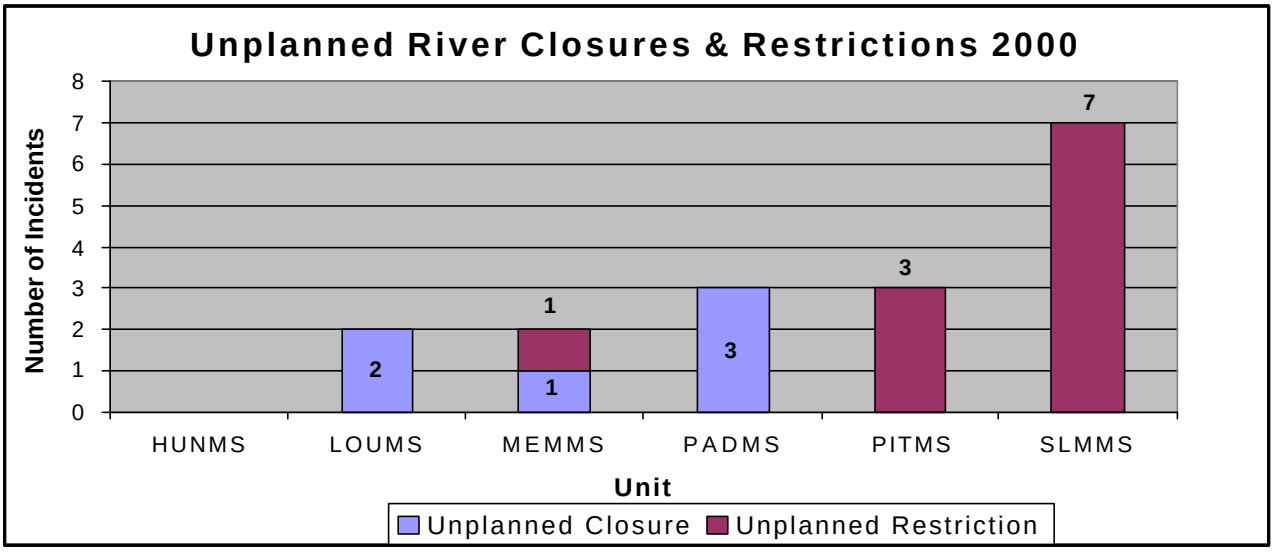



**Figure 6**

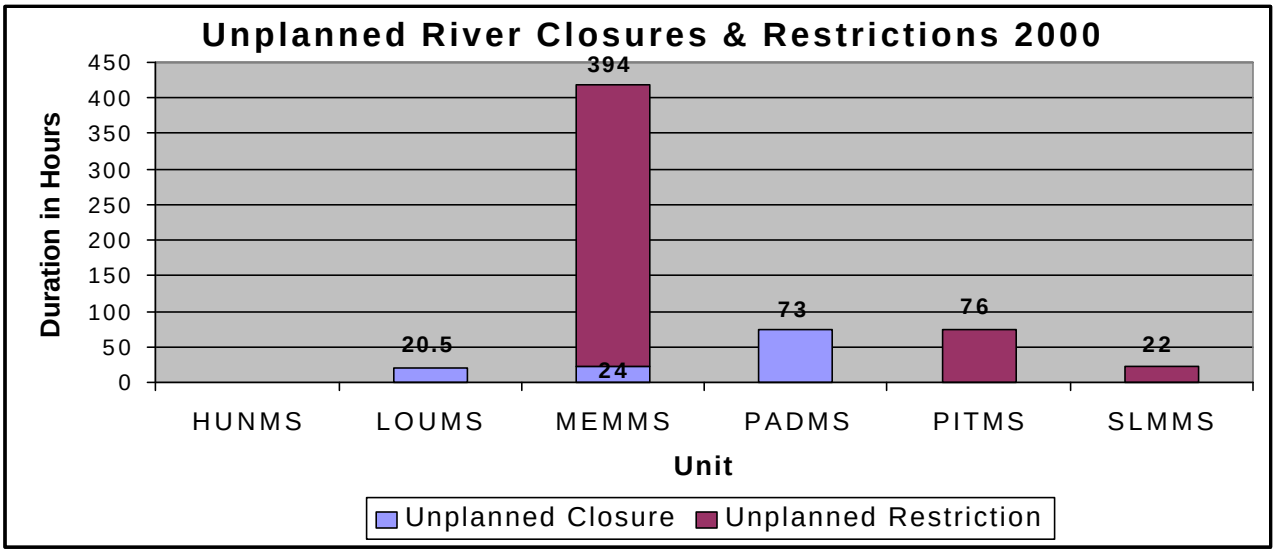



**Figure 7**

*Continued on next page*

**Comments**

Unplanned river closures and restrictions can be attributed to both human and environmental factors. An example of a human factor would be a large tow that runs aground in the channel because the draft of its loaded barges exceeds the 9' project depth to which the channel is dredged. An example of an environmental factor would be a large tow that runs aground in the channel due to excessive silting in a portion of the channel. Both of these factors can ultimately interrupt or impede the flow of traffic on the river. To get traffic moving again, the human or environmental factor causing the problem must be addressed. In general, it is much easier to address a human problem than an environmental problem. Nevertheless, some type of intervention can overcome both types of problems. For example, the overloaded barges can be lightered, or the silted navigation channel can be dredged.

Historical data regarding unplanned river closures (e.g., safety & security zones) and restrictions (e.g., one-way traffic only, daylight transits only, etc.) does not exist in MSIS. Data on these closures is now being collected by WR MSOs for the year 2000. Figures 6 and 7 are preliminary graphs to illustrate the data collected to date. After three years of baseline data is collected, it will be normalized against the total amount of cargo shipped to illustrate the rate of unplanned closures and restrictions. Data regarding amount of cargo shipped for the Mississippi River System (includes main channels and all tributaries of the Mississippi, Illinois, Missouri, and Ohio Rivers), can be obtained from annual reports produced by the U.S. Army Corps of Engineers (USACE) entitled Waterborne Commerce of the United States, Part 5-National Summaries.[5]

Appendixes 4a through 4c contain the raw data that was used to construct Figures 6 & 7. As of 12 July 2000, the Western Rivers region has seen 6 unplanned closures and 11 unplanned restrictions. The duration of unplanned closures is approximately 118 hours whereas the duration of unplanned restrictions is 492 hours. Out of the 17 total unplanned events that occurred, 65% were due to human factors.

*Continued on next page*

[5] http://www.wrsc.usace.army.mil/ndc/wcsc.htm#1998 Waterborne Commerce of the United States (WCUS)

**Performance Goal EGTWR-2**

Reduce the marine casualty rate in the Western Rivers from 1.13 to no more than 1.05 casualties per million tons of cargo shipped by 2003. This is shown in Figure 8 below. The percentage of marine casualties by type is shown in Figure 9 for the year 1999.

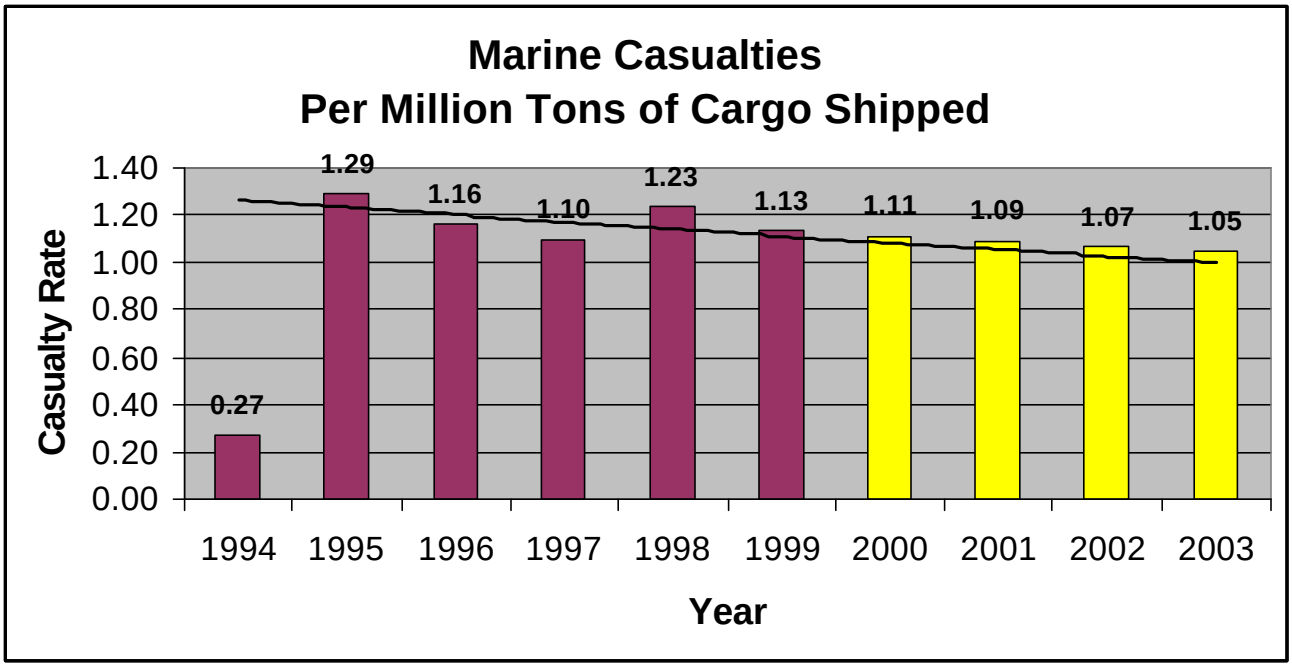



**Figure 8**

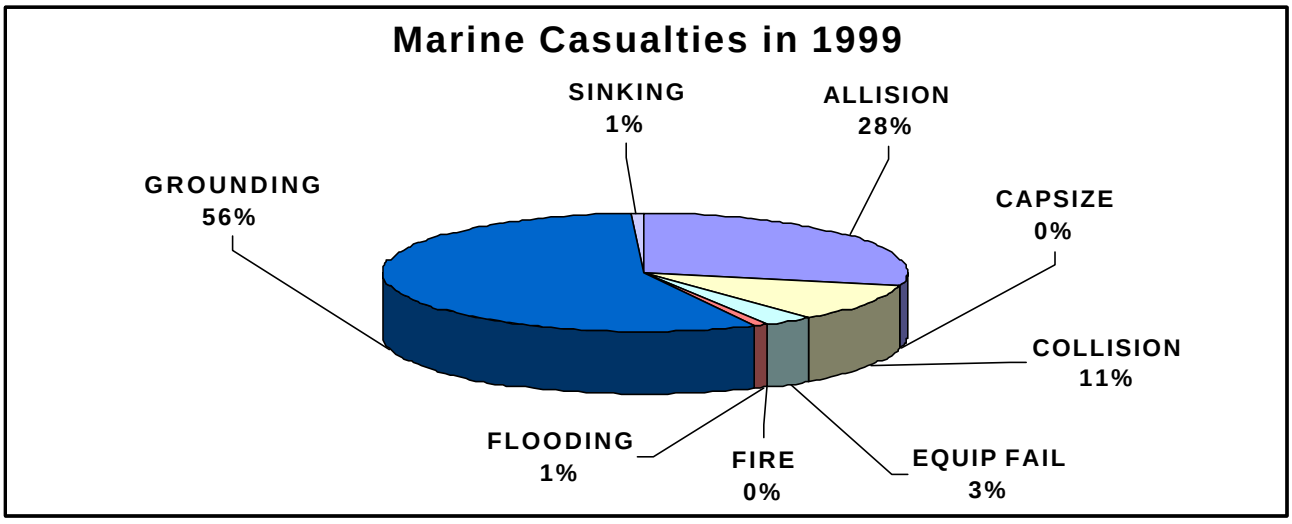



**Figure 9**

*Continued on next page*

## Economic Growth & Trade/Mobility, Continued

**Comments**

Appendixes 5a and 5b contain the raw data that was used to construct Figures 8 & 9. The table in Appendix 5a shows marine casualties by type for each WR MSO and their detachments for the years 1994-1999. The data was obtained from G-M's Mission Analysis and Planning (MAP) application on the Coast Guard intranet. The data on tons of cargo shipped was obtained from a U.S. Army Corps of Engineers (USACE) report entitled Waterborne Commerce of the United States, Part 5-National Summaries 1998.[6]

Between 1995 and 1999, the marine casualty rate dropped by 12% from 1.29 to 1.13 casualties per million tons of cargo shipped. During this period, there was an average of 576 casualties per year. In 1999, the top three types of casualties in the Western Rivers were groundings (56%), allisions (28%), and collisions (11%). Equipment failures, floodings, and sinkings accounted for the remaining 5%.

*Continued on next page*

[6] Mississippi River System, 1979-1998, by Type of Traffic, page 3-1.

**Performance Goal EGTWR-3**

Reduce the number of fleeted barge breakaway incidents per million tons of cargo shipped.

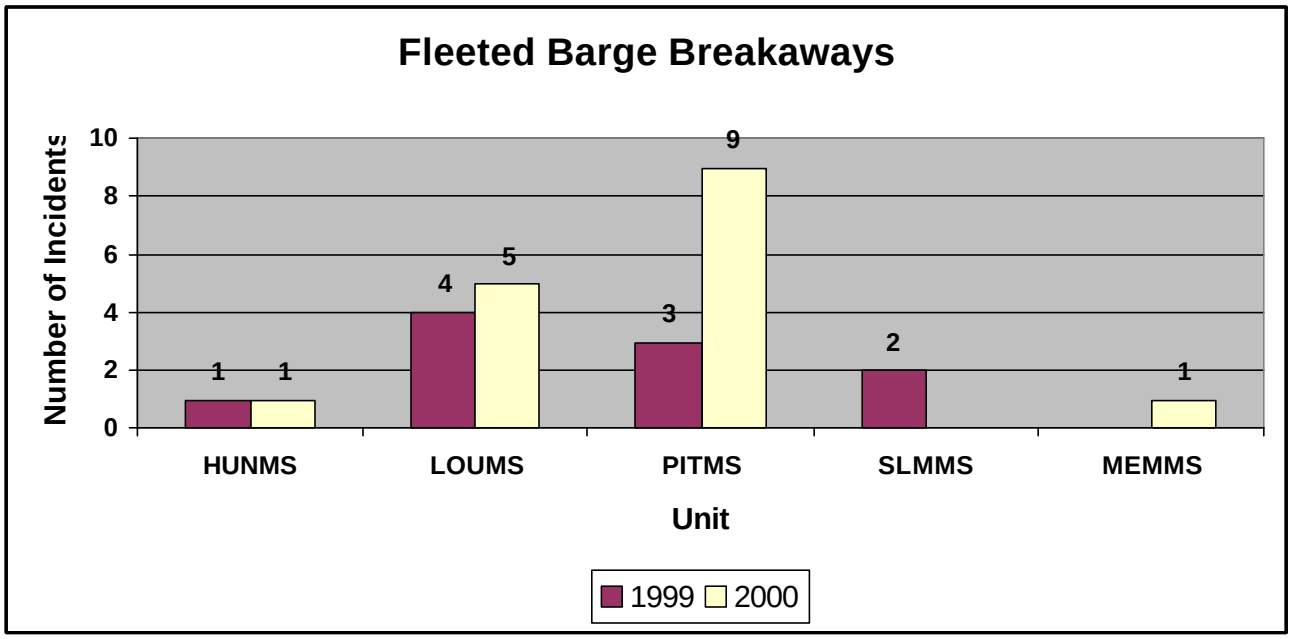



**Figure 10**

**Comments**

Breakaway barges from fleeting areas not only pose a hazard to navigation, they can also result in river closures and restrictions, thereby impeding commerce. Accurate data regarding breakaway barges is not available within MSIS. Data on breakaways is now being collected by WR MSOs for the years 1999 and 2000. Figure 10 is a preliminary graph to illustrate the data collected from each MSO as of 12 July 2000. After three years of baseline data is collected, it will be normalized against the total amount of cargo shipped to illustrate the rate of barge breakaways. The source of data for amount of cargo shipped is the same as that referenced in Performance Goals EGTWR-1 and EGTWR-2.

Appendixes 6a and 6b contain the raw data that was used to construct Figure 10. Since 1999, the Western Rivers region has seen 26 separate breakaway incidents involving a total of 107 barges. Of these breakaway incidents, approximately 80% were caused by human error.

# Strategies and Activities Used to Achieve Performance Goals

**Strategies & Activities Matrix**

Pages 16 through 19 contain a matrix that documents the strategies and activities that WR MSOs will use to achieve their stated performance goals.

All activities fall into one of three major strategies – Prevention, Education, or Enforcement. Activities that a particular MSO performs are denoted by the use of that MSO's MSIS port code underneath the relevant performance goal.

*Continued on next page*

# Strategic Goal Activities Matrix

**Mission Goal: Safety**

**Strategic Goal: Eliminate deaths, injuries, and property damage associated with commercial maritime operations**

| Strategies | Activities | Performance Goals | |
|---|---|---|---|
| | | MSWR-1 | MSWR-2 |
| | | Reduce the crew member casualty rate by 45% from the 1998 statistical baseline of 1.91 casualties per 100,000 workers to 1.05 casualties per 100,000 workers by 2003. | Reduce the passenger casualty rate by 21% from the 1998 statistical baseline of .56 casualties per million passengers to .44 casualties per million passengers by 2003. |
| Prevention | Conduct root cause analysis on all marine casualty incidents | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| | Provide industry with feedback on root causes of casualty incidents via correspondence, information bulletins, industry meetings, professional periodicals, and unit web sites | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| | Conduct random boarding on UTV's owned and operated by companies not participating in CTVEP | SLMMS, PADMS | |
| | Conduct CTVEP exams on UTV's for those companies requesting participation in the program | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| | Conduct risk analysis to identify highest risk activities in the COTP/OCMI zone | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| | Evaluate drills on board certificated vessels as required by COMDT policy | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| | Evaluate annual HCPV exercises on all gaming vessels. | LOUMS | LOUMS, SLMMS, PADMS |
| | Actively participate in Towing Companies' pilot and crew safety meetings | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, PITMS, PADMS |
| | Conduct required COI inspections & reinspections on certificated vessels | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| Enforcement | Evaluate each marine violation incident and determine the appropriate remedial action or penalty | LOUMS, MEMMS, HUNMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, PITMS, PADMS |
| | Implement the enforcement measure, e.g., recommend civil penalty, conduct S & R hearing, issue ticket or letter of warning, etc. | LOUMS, MEMMS, HUNMS, PADMS | LOUMS, MEMMS, HUNMS, PITMS, PADMS |
| | Periodically conduct targeted enforcement operations to address area specific problems, e.g., illegal passenger vessel operations on navigable lakes, intentional oil discharges, etc. | LOUMS, MEMMS, PITMS | LOUMS, MEMMS, SLMMS, PITMS, PADMS |
| Education | Issue periodic bulletins, web site updates, and correspondence to industry regarding marine safety issues and new developments | LOUMS, MEMMS, HUNMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| | Participate in industry day meetings and other industry/CG gatherings to exchange information and deepen customer relations | LOUMS, MEMMS, HUNMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| | Broaden CG Auxiliary efforts in educating the recreational boating public through boating safety classes, sea partner exhibits, and "Coastie" the robotic tugboat utilization | LOUMS, MEMMS, HUNMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, PITMS, PADMS |

## Strategic Goal Activities Matrix

**Mission Goal: Security**

**Strategic Goal: Eliminate marine transportation and river security vulnerability**

| Strategies | Activities | Performance Goals | |
|---|---|---|---|
| | | SECWR-1 | SECWR-2 |
| | | Reduce the risk to marine transportation related (MTR) waterfront facilities posed by intentional criminal or terrorist acts so that 75% of vital facilities are rated no higher than medium risk by 2003. | To Be Developed |
| Prevention | To Be Developed | | |
| Enforcement | To Be Developed | | |
| Education | To Be Developed | | |

# Strategic Goal Activities Matrix

**Mission Goal: Human and Natural Environment**

**Strategic Goal: Eliminate environmental damage associated with maritime transportation and operations on and around the nations waterways.**

| | | Performance Goals | |
|---|---|---|---|
| | | **HNEWR-1:** | **HNEWR-2:** |
| | | Reduce annual volume of oil pollution from maritime sources in the Western Rivers to no more than 1.6 gallons spilled per kilo-ton shipped by 2003. | Reduce the number of medium and major oil & hazardous material spills from maritime sources in the Western Rivers to an annual moving average rate of no more than .145 medium or major spills per million tons shipped by 2003. |
| **Strategies** | **Activities** | | |
| Prevention | Conduct root cause analysis on all marine casualty and pollution incidents | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Provide industry with feedback on root causes of casualty incidents via correspondence, information bulletins, industry meetings, professional periodicals, and unit web sites | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Conduct random boarding on UTV's owned and operated by companies not participating in CTVEP | SLMMS, PADMS | SLMMS, PADMS |
| | Conduct CTVEP exams on UTV's for those companies requesting participation in the program | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PADMS |
| | Conduct risk analysis to identify highest risk activities in the COTP/OCMI zone | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| | Evaluate drills on board certificated vessels as required by COMDT policy | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| | Actively participate in Towing Companies' pilot and crew safety meetings | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Conduct harbor patrols in areas and during hours of highest risk activities | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Conduct barge monitors on high-risk cargo transfers | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Conduct inspections at high-risk marine transfer related (MTR) facilities | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Conduct barge fleet examinations on high-risk fleets | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Conduct pollution response/boom deployment exercises | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| Enforcement | Evaluate each marine violation incident and determine the appropriate remedial action or penalty | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Implement the enforcement measure, e.g., recommend civil penalty, conduct S & R hearing, issue ticket or letter of warning, etc. | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Periodically conduct targeted enforcement operations to address area specific problems, e.g., illegal passenger vessel operations on navigable lakes, intentional oil discharges, etc. | LOUMS, MEMMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, SLMMS, PITMS, PADMS |
| Educati | Issue periodic bulletins, web site updates, and correspondence to industry regarding marine safety issues and new developments | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |
| | Participate in industry day meetings and other industry/CG gatherings to exchange information and deepen customer relations | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, HUNMS, MEMMS, PITMS, PADMS |

# Strategic Goal Activities Matrix

## Mission Goal: Economic Growth & Trade/Mobility

**Strategic Goal: Maximize the availability of safe, efficient, and environmentally sound waterways for all users by eliminating interruptions and impediments that restrict the economical movement of goods and people.**

| Strategies | Activities | Performance Goals | | |
|---|---|---|---|---|
| | | EGTWR-1 | EGTWR-2 | EGTWR-3 |
| | | Reduce the number and duration of unplanned river closures and restrictions per million tons of cargo shipped. | Reduce the marine casualty rate in the Western Rivers from 1.13 to no more than 1.05 casualties per million tons of cargo shipped by 2003. | Reduce the number of fleeted barge breakaway incidents per million tons of cargo shipped. |
| Prevention | Conduct analysis of marine casualties that cause river closures or restrictions in AOR | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS |
| | Analyze marine event plans, coordination, and operations | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | HUNMS, MEMMS, PITMS | HUNMS, MEMMS, PITMS |
| | Establish Port Safety Committees | LOUMS, SLMMS, MEMMS, PITMS | LOUMS, SLMMS, MEMMS, PITMS | LOUMS, SLMMS, MEMMS, PITMS |
| | Identify current best practices and share with other MSO's | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Hot wash unplanned river closures with involved parties | LOUMS, HUNMS, MEMMS, PADMS | LOUMS, HUNMS, MEMMS, PADMS | LOUMS, HUNMS, MEMMS |
| | Share lessons learned with all involved parties and related agencies | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Conduct root cause analysis on all marine casualty incidents | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, SLMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Provide industry with feedback on root causes of casualty incidents via correspondence, information bulletins, industry meetings, professional periodicals, and unit web sites | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS |
| | Conduct random boarding on UTV's owned and operated by companies not participating in CTVEP | PADMS | SLMMS, PADMS | |
| | Conduct CTVEP exams on UTV's for those companies requesting participation in the program | LOUMS, PITMS, PADMS | LOUMS, SLMMS, PITMS, PADMS | |
| | Conduct risk analysis to identify highest risk activities in the COTP/OCMI zone | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| | Evaluate drills on board certificated vessels as required by COMDT policy | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | |
| | Evaluate annual HCPV exercises on all gaming vessels. | LOUMS, PADMS | LOUMS, PADMS | |
| | Actively participate in Towing Companies' pilot and crew safety meetings | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS |
| | Conduct analysis of barge breakaways in AOR | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| | Conduct examinations of barge fleeting areas | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Examine fleeting areas for compliance with industry standards | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Identify current best practices and share with industry and other MSO's | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Share lessons learned from breakaway incidents | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS | LOUMS, HUNMS, MEMMS, PITMS |
| Enforcemer | Evaluate each marine violation incident and determine the appropriate remedial action or penalty | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| | Implement the enforcement measure, e.g., recommend civil penalty, conduct S & R hearing, issue ticket or letter of warning, etc. | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS |
| | Periodically conduct targeted enforcement operations to address area specific problems, e.g., illegal passenger vessel operations on navigable lakes, intentional oil discharges, etc. | LOUMS, MEMMS, PITMS, PADMS | LOUMS, MEMMS, PITMS, PADMS | LOUMS, MEMMS, PITMS |
| Education | Issue periodic bulletins, web site updates, and correspondence to industry regarding marine safety issues and new developments | LOUMS, MEMMS, HUNMS, SLMMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PADMS | LOUMS, HUNMS, MEMMS |
| | Participate in industry day meetings and other industry/CG gatherings to exchange information and deepen customer relations | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, MEMMS, HUNMS, SLMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS |
| | Broaden CG Auxiliary efforts in educating the recreational boating public through boating safety classes, sea partner exhibits, and "Coastie" the robotic tugboat utilization | LOUMS, HUNMS, MEMMS, PITMS, PADMS | LOUMS, HUNMS, MEMMS, PITMS, PADMS | HUNMS, MEMMS |

# Appendix 1a

**Crewmember Deaths**

| Calendar Year | | 2000 Deaths | 1999 Deaths | 1998 Deaths | 1997 Deaths | 1996 Deaths | 1995 Deaths | 1994 Deaths | TOTAL Deaths |
|---|---|---|---|---|---|---|---|---|---|
| Port | Role Type | Sum | Sum | Sum | Sum | Sum | Sum | Sum | Sum |
| MSD CINCINNATI | DECK CREW | . | 0 | 0 | 0 | 0 | 0 | . | 0 |
| | EMPLOYEE | . | . | 0 | 0 | 0 | . | . | 0 |
| | ENGINE CREW | . | . | . | 0 | . | . | . | 0 |
| | TOTAL | . | 0 | 0 | 0 | 0 | 0 | . | 0 |
| MSD DAVENPORT | DECK CREW | . | . | 0 | 0 | 0 | 0 | 0 | 0 |
| | DECK OFFICER | . | . | 0 | . | . | . | 0 | 0 |
| | EMPLOYEE | . | . | . | . | . | 0 | 0 | 0 |
| | ENGINE CREW | . | . | 0 | . | . | 0 | . | 0 |
| | MASTER | . | . | . | . | . | . | 0 | 0 |
| | TOTAL | . | . | 0 | 0 | 0 | 0 | 0 | 0 |
| MSD GREENVILLE | DECK CREW | . | . | . | 1 | . | . | . | 1 |
| | MASTER | . | . | 1 | . | . | . | . | 1 |
| | TOTAL | . | . | 1 | 1 | . | . | . | 2 |
| MSD NASHVILLE | DECK CREW | . | 1 | 0 | . | . | . | . | 1 |
| | TOTAL | . | 1 | 0 | . | . | . | . | 1 |
| MSD PEORIA | DECK CREW | . | . | 0 | 0 | 0 | 0 | . | 0 |
| | EMPLOYEE | . | 0 | . | . | 0 | . | . | 0 |
| | ENGINE CREW | . | . | . | . | 0 | . | . | 0 |
| | MASTER | . | 0 | . | . | . | . | . | 0 |
| | TOTAL | . | 0 | 0 | 0 | 0 | 0 | . | 0 |
| MSO HUNTINGTON | DECK CREW | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| | EMPLOYEE | . | . | . | . | 0 | . | . | 0 |
| | ENG OFFICER | . | . | 0 | . | . | 0 | . | 0 |
| | ENGINE CREW | . | . | . | . | 0 | . | 0 | 0 |
| | MASTER | . | 2 | . | . | . | . | . | 2 |
| | TOTAL | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 4 |
| MSO LOUISVILLE | DECK CREW | . | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DECK OFFICER | . | 0 | . | . | . | . | . | 0 |
| | EMPLOYEE | . | 0 | . | 0 | . | 0 | . | 0 |
| | ENGINE CREW | . | 0 | . | . | . | 0 | . | 0 |
| | MASTER | . | . | . | 0 | . | . | . | 0 |
| | STEWARD DEPAR | . | 0 | . | 0 | . | . | . | 0 |
| | TOTAL | . | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MSO MEMPHIS | DECK CREW | . | 0 | 0 | 0 | 1 | 1 | 1 | 3 |
| | EMPLOYEE | . | 1 | . | 1 | . | . | . | 2 |
| | ENG OFFICER | . | . | . | . | 0 | . | . | 0 |
| | ENGINE CREW | . | . | . | . | 0 | . | 0 | 0 |
| | MASTER | . | 0 | 1 | . | 0 | . | . | 1 |
| | STEWARD DEPAR | . | 0 | . | . | . | 0 | . | 0 |
| | TANKERMAN | . | . | . | . | . | . | 0 | 0 |
| | TOTAL | . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| MSO PADUCAH | DECK CREW | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 8 |
| | DECK OFFICER | . | 1 | . | . | . | . | . | 1 |
| | EMPLOYEE | . | . | 0 | 0 | 0 | 0 | . | 0 |
| | ENG OFFICER | . | . | . | 0 | . | . | . | 0 |
| | ENGINE CREW | . | . | 0 | 0 | 0 | 0 | 0 | 0 |
| | MASTER | . | . | . | . | 0 | . | . | 0 |
| | STEWARD DEPAR | . | . | . | . | 0 | . | . | 0 |
| | TANKERMAN | . | . | . | 0 | . | 0 | . | 0 |
| | TOTAL | 0 | 2 | 1 | 2 | 1 | 2 | 1 | 9 |
| MSO PITTSBURG | DECK CREW | . | 0 | 1 | 0 | 1 | 0 | . | 2 |
| | EMPLOYEE | . | . | . | 0 | . | . | . | 0 |
| | MASTER | . | . | . | 0 | . | . | . | 0 |
| | TOTAL | . | 0 | 1 | 0 | 1 | 0 | . | 2 |
| MSO ST. LOUIS | DECK CREW | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 4 |
| | EMPLOYEE | . | 0 | 0 | 0 | 0 | . | . | 0 |
| | ENG OFFICER | . | . | . | . | 0 | . | . | 0 |
| | ENGINE CREW | . | . | . | . | . | 0 | . | 0 |
| | MASTER | . | . | . | 2 | . | 0 | . | 2 |
| | STEWARD DEPAR | . | . | . | 0 | . | . | . | 0 |
| | TOTAL | 1 | 1 | 0 | 2 | 0 | 2 | 0 | 6 |
| TOTAL | DECK CREW | 1 | 3 | 2 | 3 | 3 | 7 | 2 | 21 |
| | DECK OFFICER | . | 1 | 0 | . | . | . | 0 | 1 |
| | EMPLOYEE | . | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| | ENG OFFICER | . | . | 0 | 0 | 0 | 0 | . | 0 |
| | ENGINE CREW | . | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | MASTER | . | 2 | 2 | 2 | 0 | 0 | 0 | 6 |
| | STEWARD DEPAR | . | 0 | . | 0 | 0 | 0 | . | 0 |
| | TANKERMAN | . | . | . | 0 | . | 0 | 0 | 0 |
| | TOTAL | 1 | 7 | 4 | 6 | 3 | 7 | 2 | 30 |

# Appendix 1b

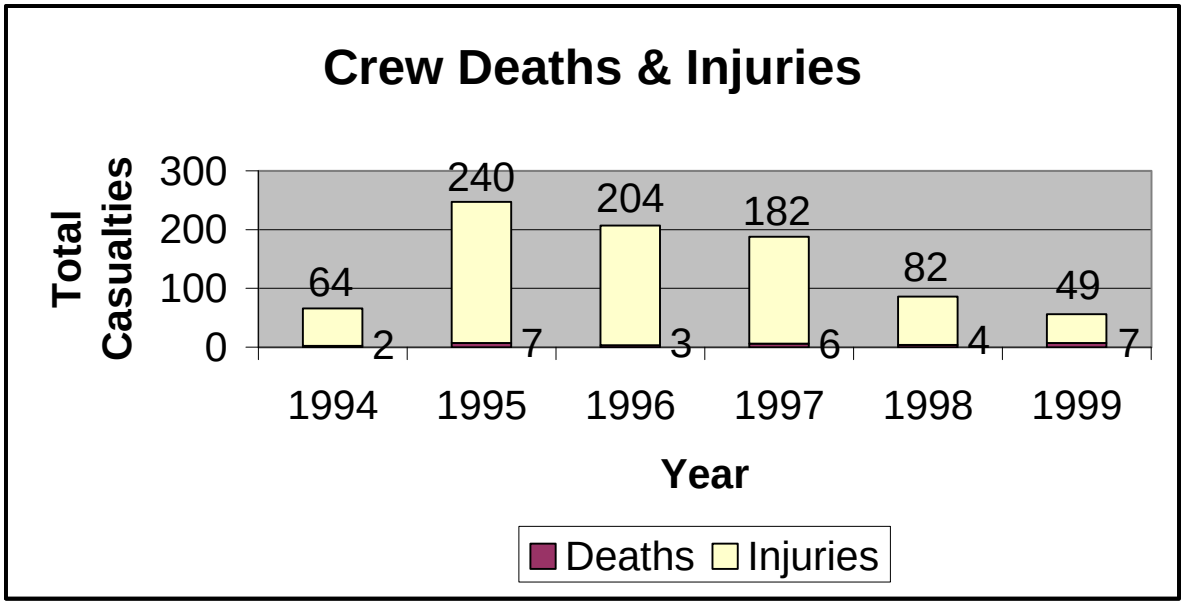
| Crewmember Injuries | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Calendar Year | | 2000 Injuries | 1999 Injuries | 1998 Injuries | 1997 Injuries | 1996 Injuries | 1995 Injuries | 1994 Injuries | TOTAL Injuries |
| Port | Role Type | Sum | Sum | Sum | Sum | Sum | Sum | Sum | Sum |
| MSD CINCINNATI | DECK CREW | . | 2 | 3 | 6 | 11 | 9 | . | 31 |
| | EMPLOYEE | . | . | 8 | 11 | 1 | . | . | 20 |
| | ENGINE CREW | . | . | . | 1 | . | . | . | 1 |
| | TOTAL | . | 2 | 11 | 18 | 12 | 9 | . | 52 |
| MSD DAVENPORT | DECK CREW | . | . | 4 | 2 | 5 | 19 | 5 | 35 |
| | DECK OFFICER | . | . | 1 | . | . | . | 1 | 2 |
| | EMPLOYEE | . | . | . | . | . | 7 | 8 | 15 |
| | ENGINE CREW | . | . | 1 | . | . | 2 | . | 3 |
| | MASTER | . | . | . | . | . | . | 1 | 1 |
| | TOTAL | . | . | 6 | 2 | 5 | 28 | 15 | 56 |
| MSD GREENVILLE | DECK CREW | . | . | . | 1 | . | . | . | 1 |
| | MASTER | . | . | 0 | . | . | . | . | 0 |
| | TOTAL | . | . | 0 | 1 | . | . | . | 1 |
| MSD NASHVILLE | DECK CREW | . | 0 | 2 | . | . | . | . | 2 |
| | TOTAL | . | 0 | 2 | . | . | . | . | 2 |
| MSD PEORIA | DECK CREW | . | . | 5 | 2 | 4 | 6 | . | 17 |
| | EMPLOYEE | . | 1 | . | . | 3 | . | . | 4 |
| | ENGINE CREW | . | . | . | . | 2 | . | . | 2 |
| | MASTER | . | 1 | . | . | . | . | . | 1 |
| | TOTAL | . | 2 | 5 | 2 | 9 | 6 | . | 24 |
| MSO HUNTINGTON | DECK CREW | 1 | 8 | 5 | 21 | 22 | 11 | 3 | 71 |
| | EMPLOYEE | . | . | . | . | 1 | . | . | 1 |
| | ENG OFFICER | . | . | 0 | . | . | 1 | . | 1 |
| | ENGINE CREW | . | . | . | . | 1 | . | 1 | 2 |
| | MASTER | . | 1 | . | . | . | . | . | 1 |
| | TOTAL | 1 | 9 | 5 | 21 | 24 | 12 | 4 | 76 |
| MSO LOUISVILLE | DECK CREW | . | 10 | 24 | 18 | 22 | 44 | 8 | 126 |
| | DECK OFFICER | . | 2 | . | . | . | . | . | 2 |
| | EMPLOYEE | . | 1 | . | 2 | . | 2 | . | 5 |
| | ENGINE CREW | . | 1 | . | . | . | 3 | . | 4 |
| | MASTER | . | . | . | 1 | . | . | . | 1 |
| | STEWARD DEPART | . | 1 | . | 1 | . | . | . | 2 |
| | TOTAL | . | 15 | 24 | 22 | 22 | 49 | 8 | 140 |
| MSO MEMPHIS | DECK CREW | . | 5 | 6 | 18 | 16 | 14 | 4 | 63 |
| | EMPLOYEE | . | 0 | . | 0 | . | . | . | 0 |
| | ENG OFFICER | . | . | . | . | 2 | . | . | 2 |
| | ENGINE CREW | . | . | . | . | 1 | . | 1 | 2 |
| | MASTER | . | 2 | 0 | . | 1 | . | . | 3 |
| | STEWARD DEPART | . | 1 | . | . | . | 1 | . | 2 |
| | TANKERMAN | . | . | . | . | . | . | 1 | 1 |
| | TOTAL | . | 8 | 6 | 18 | 20 | 15 | 6 | 73 |
| MSO PADUCAH | DECK CREW | 2 | 2 | 10 | 62 | 69 | 78 | 21 | 244 |
| | DECK OFFICER | . | 0 | . | . | . | . | . | 0 |
| | EMPLOYEE | . | . | 2 | 7 | 17 | 11 | . | 37 |
| | ENG OFFICER | . | . | . | 1 | . | . | . | 1 |
| | ENGINE CREW | . | . | 1 | 1 | 2 | 4 | 3 | 11 |
| | MASTER | . | . | . | . | 1 | . | . | 1 |
| | STEWARD DEPART | . | . | . | . | 1 | . | . | 1 |
| | TANKERMAN | . | . | . | 1 | . | 1 | . | 2 |
| | TOTAL | 2 | 2 | 13 | 72 | 90 | 94 | 24 | 297 |
| MSO PITTSBURG | DECK CREW | . | 3 | 5 | 8 | 8 | 3 | . | 27 |
| | EMPLOYEE | . | . | . | 1 | . | . | . | 1 |
| | MASTER | . | . | . | 1 | . | . | . | 1 |
| | TOTAL | . | 3 | 5 | 10 | 8 | 3 | . | 29 |
| MSO ST. LOUIS | DECK CREW | 2 | 7 | 4 | 14 | 12 | 22 | 7 | 68 |
| | EMPLOYEE | . | 1 | 1 | 1 | 1 | . | . | 4 |
| | ENG OFFICER | . | . | . | . | 1 | . | . | 1 |
| | ENGINE CREW | . | . | . | . | . | 1 | . | 1 |
| | MASTER | . | . | . | 0 | . | 1 | . | 1 |
| | STEWARD DEPART | . | . | . | 1 | . | . | . | 1 |
| | TOTAL | 2 | 8 | 5 | 16 | 14 | 24 | 7 | 76 |
| TOTAL | DECK CREW | 5 | 37 | 68 | 152 | 169 | 206 | 48 | 685 |
| | DECK OFFICER | . | 2 | 1 | . | . | . | 1 | 4 |
| | EMPLOYEE | . | 3 | 11 | 22 | 23 | 20 | 8 | 87 |
| | ENG OFFICER | . | . | 0 | 1 | 3 | 1 | . | 5 |
| | ENGINE CREW | . | 1 | 2 | 2 | 6 | 10 | 5 | 26 |
| | MASTER | . | 4 | 0 | 2 | 2 | 1 | 1 | 10 |
| | STEWARD DEPART | . | 2 | . | 2 | 1 | 1 | . | 6 |
| | TANKERMAN | . | . | . | 1 | . | 1 | 1 | 3 |
| | TOTAL | 5 | 49 | 82 | 182 | 204 | 240 | 64 | 826 |

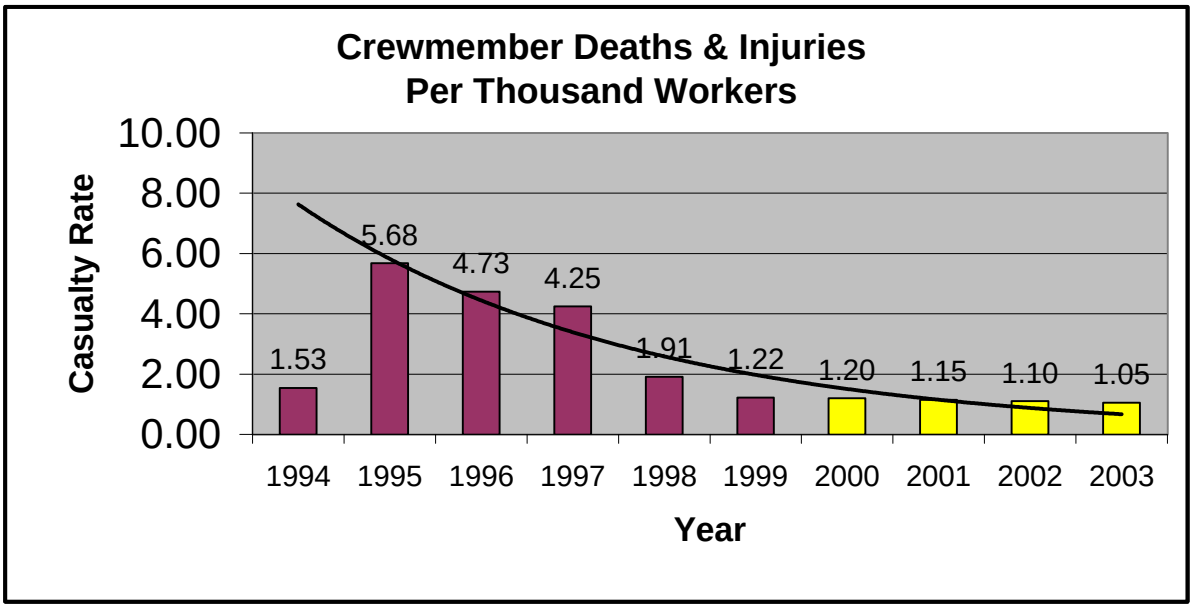
# Appendix 1c

| Crewman Deaths & Injuries | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Deaths | 2 | 7 | 3 | 6 | 4 | 7 | 1 | | | |
| Injuries | 64 | 240 | 204 | 182 | 82 | 49 | 5 | | | |
| **Total** | 66 | 247 | 207 | 188 | 86 | 56 | 6 | | | |
| | | | | | | | | | | |
| WR Marine Employment (thousands) | 43 | 43.5 | 43.8 | 44.3 | 45 | 45.8 | 46.3 | | | |

| Crewman Deaths & Injuries | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Casualties Per Thousand Workers | 1.53 | 5.68 | 4.73 | 4.25 | 1.91 | 1.22 | 1.20 | 1.15 | 1.10 | 1.05 |

Goal



# Appendix 2a

| Passenger Deaths | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Calendar Year | | 1999 Deaths | 1998 Deaths | 1997 Deaths | 1996 Deaths | 1995 Deaths | 1994 Deaths | TOTAL Deaths |
| Port | Role Type | Sum | Sum | Sum | Sum | Sum | Sum | Sum |
| MSD CINCINNATI | PASSENGER | 0 | 0 | 0 | . | . | . | 0 |
| | TOTAL | 0 | 0 | 0 | . | . | . | 0 |
| MSD DAVENPORT | PASSENGER | . | . | . | . | 0 | 0 | 0 |
| | TOTAL | . | . | . | . | 0 | 0 | 0 |
| MSD PEORIA | PASSENGER | 0 | . | . | 0 | 1 | . | 1 |
| | TOTAL | 0 | . | . | 0 | 1 | . | 1 |
| MSO HUNTINGTON | PASSENGER | . | . | . | . | 4 | . | 4 |
| | TOTAL | . | . | . | . | 4 | . | 4 |
| MSO LOUISVILLE | PASSENGER | 0 | 0 | . | 0 | 0 | . | 0 |
| | TOTAL | 0 | 0 | . | 0 | 0 | . | 0 |
| MSO MEMPHIS | PASSENGER | 14 | 0 | 0 | . | . | . | 14 |
| | TOTAL | 14 | 0 | 0 | . | . | . | 14 |
| MSO PADUCAH | PASSENGER | . | . | 0 | 0 | 1 | . | 1 |
| | TOTAL | . | . | 0 | 0 | 1 | . | 1 |
| MSO PITTSBURG | PASSENGER | 0 | . | . | . | . | . | 0 |
| | TOTAL | 0 | . | . | . | . | . | 0 |
| MSO ST. LOUIS | PASSENGER | . | 2 | 2 | 0 | 0 | . | 4 |
| | TOTAL | . | 2 | 2 | 0 | 0 | . | 4 |
| TOTAL | PASSENGER | 14 | 2 | 2 | 0 | 6 | 0 | 24 |
| | TOTAL | 14 | 2 | 2 | 0 | 6 | 0 | 24 |

# Appendix 2b

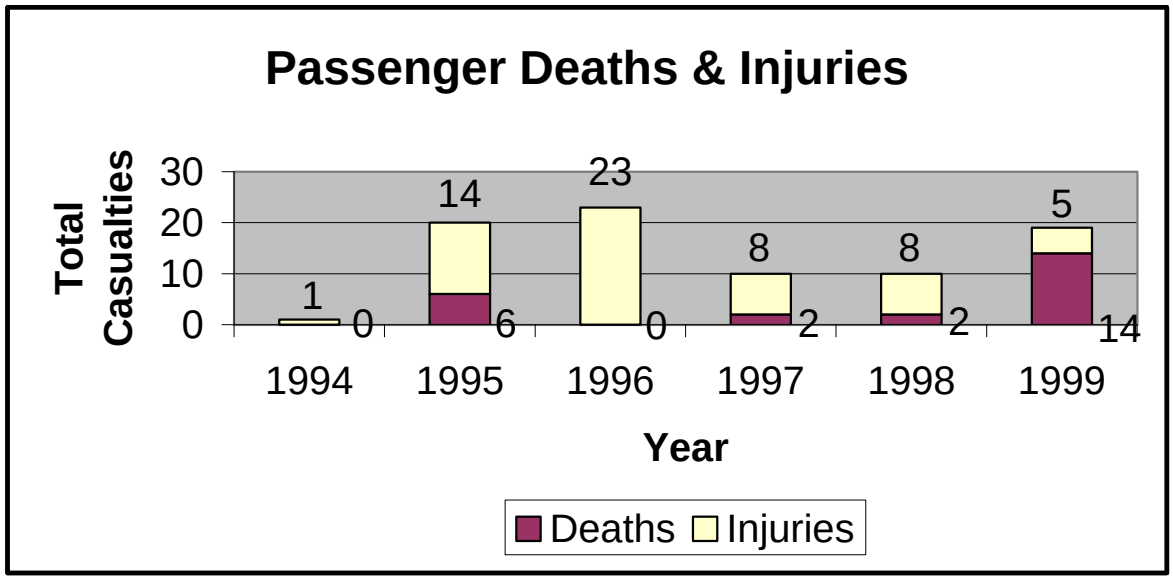
| Passenger Injuries | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Calendar Year | | 1999 Injuries | 1998 Injuries | 1997 Injuries | 1996 Injuries | 1995 Injuries | 1994 Injuries | TOTAL Injuries |
| Port | Role Type | Sum | Sum | Sum | Sum | Sum | Sum | Sum |
| MSD CINCINNATI | PASSENGER | 1 | 2 | 4 | . | . | . | 7 |
| | TOTAL | 1 | 2 | 4 | . | . | . | 7 |
| MSD DAVENPORT | PASSENGER | . | . | . | . | 4 | 1 | 5 |
| | TOTAL | . | . | . | . | 4 | 1 | 5 |
| MSD PEORIA | PASSENGER | 1 | . | . | 5 | 1 | . | 7 |
| | TOTAL | 1 | . | . | 5 | 1 | . | 7 |
| MSO HUNTINGTON | PASSENGER | . | . | . | . | 2 | . | 2 |
| | TOTAL | . | . | . | . | 2 | . | 2 |
| MSO LOUISVILLE | PASSENGER | 2 | 2 | . | 1 | 1 | . | 6 |
| | TOTAL | 2 | 2 | . | 1 | 1 | . | 6 |
| MSO MEMPHIS | PASSENGER | 0 | 1 | 2 | . | . | . | 3 |
| | TOTAL | 0 | 1 | 2 | . | . | . | 3 |
| MSO PADUCAH | PASSENGER | . | . | 2 | 15 | 3 | . | 20 |
| | TOTAL | . | . | 2 | 15 | 3 | . | 20 |
| MSO PITTSBURG | PASSENGER | 1 | . | . | . | . | . | 1 |
| | TOTAL | 1 | . | . | . | . | . | 1 |
| MSO ST. LOUIS | PASSENGER | . | 3 | 0 | 2 | 3 | . | 8 |
| | TOTAL | . | 3 | 0 | 2 | 3 | . | 8 |
| TOTAL | PASSENGER | 5 | 8 | 8 | 23 | 14 | 1 | 59 |
| | TOTAL | 5 | 8 | 8 | 23 | 14 | 1 | 59 |

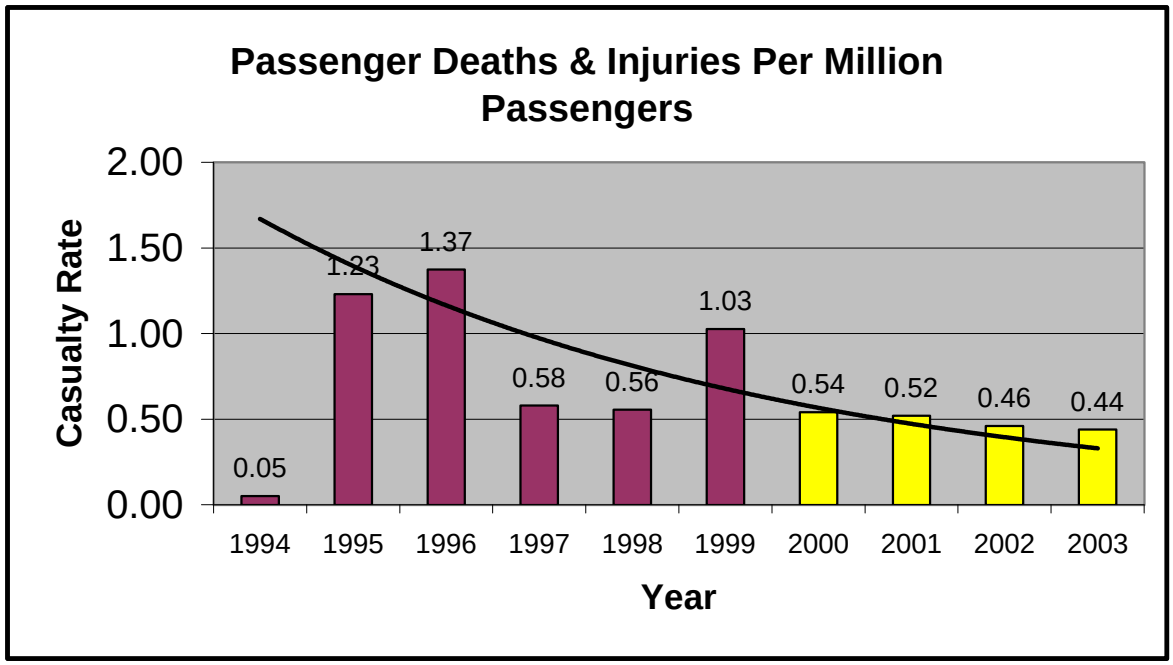
# Appendix 2c

| Passenger Deaths & Injuries | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Deaths | 0 | 6 | 0 | 2 | 2 | 14 | | | | |
| Injuries | 1 | 14 | 23 | 8 | 8 | 5 | | | | |
| **Total** | 1 | 20 | 23 | 10 | 10 | 19 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | |
| Passengers (millions) | 19.8 | 16.3 | 16.8 | 17.3 | 18 | 18.5 | 0 | 0 | 0 | 0 |

| Passenger Deaths & Injuries | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Casualties Per Million Passengers | 0.05 | 1.23 | 1.37 | 0.58 | 0.56 | 1.03 | 0.54 | 0.52 | 0.46 | 0.44 |

Equals Goal



# Appendix 3a

| Sum of Spill In Water | | Year | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parent Unit | Mat Category | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | Grand Total |
| HUNMS | OIL/OILY | 5,167 | 2,510 | 573 | 5,908 | 50,577 | 12 | 64,747 |
| HUNMS Total | | 5,167 | 2,510 | 573 | 5,908 | 50,577 | 12 | 64,747 |
| LOUMS | OIL/OILY | 447 | 6,841 | 375 | 2,924 | 807 | 5,423 | 16,817 |
| LOUMS Total | | 447 | 6,841 | 375 | 2,924 | 807 | 5,423 | 16,817 |
| MEMMS | OIL/OILY | 507 | 13,715 | 10,981 | 49,456 | 30,541 | 208 | 105,408 |
| MEMMS Total | | 507 | 13,715 | 10,981 | 49,456 | 30,541 | 208 | 105,408 |
| PADMS | OIL/OILY | 971 | 11,169 | 4,239 | 17,471 | 29 | 315 | 34,194 |
| PADMS Total | | 971 | 11,169 | 4,239 | 17,471 | 29 | 315 | 34,194 |
| PITMS | OIL/OILY | 2,706 | 3,887 | 658 | 3,033 | 1,248 | 5,701 | 17,233 |
| PITMS Total | | 2,706 | 3,887 | 658 | 3,033 | 1,248 | 5,701 | 17,233 |
| SLMMS | OIL/OILY | 21,859 | 105,821 | 7,386 | 9,040 | 5,968 | 48,338 | 198,412 |
| SLMMS Total | | 21,859 | 105,821 | 7,386 | 9,040 | 5,968 | 48,338 | 198,412 |
| Grand Total | | 31,657 | 143,943 | 24,212 | 87,832 | 89,170 | 59,997 | 436,811 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Cargo Shipped (k-tons)* | 20,350 | 20,765 | 21,189 | 14,962 | 23,391 | 24,736 | |

**Spill Rate in Gallons per K-tons Shipped**

| Year | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All WR MSOs | 1.6 | 6.9 | 1.1 | 5.9 | 3.8 | 2.4 | 2.4 | 2.2 | 2 | 1.8 | 1.6 |

Equals Goal

*Amount of cargo shipped was obtained by subtracting cargo moved between Baton Rouge, LA to Mouth of Passes from the entire Mississippi River System.

# Appendix 3b

| Count of Spill Severity | | | Year | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parent Unit | Mat Category | Spill Severity | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | Grand Total |
| MEMMS | HAZMAT | MINOR | | | | | 1 | | 1 |
| | | NS | | | | | 1 | | 1 |
| | HAZMAT Total | | | | | | 2 | | 2 |
| | OIL/OILY | MAJOR | | | 1 | 1 | 1 | | 3 |
| | | MEDIUM | | 2 | | 4 | | | 6 |
| | | MINOR | 29 | 28 | 7 | 11 | 14 | 5 | 94 |
| | | NS | | | 1 | | | | 1 |
| | OIL/OILY Total | | 29 | 30 | 9 | 16 | 15 | 5 | 104 |
| MEMMS Total | | | 29 | 30 | 9 | 16 | 17 | 5 | 106 |
| PADMS | HAZMAT | MINOR | | | | | 1 | 1 | 2 |
| | HAZMAT Total | | | | | | 1 | 1 | 2 |
| | OIL/OILY | | | | | | 1 | | 1 |
| | | MAJOR | | | | 1 | | | 1 |
| | | MEDIUM | | 2 | 1 | 2 | | | 5 |
| | | MINOR | 35 | 24 | 13 | 12 | 8 | 8 | 100 |
| | | NS | 1 | | | | | 1 | 2 |
| | | POTENT | | 2 | | | | | 2 |
| | OIL/OILY Total | | 36 | 28 | 14 | 15 | 9 | 9 | 111 |
| PADMS Total | | | 36 | 28 | 14 | 15 | 10 | 10 | 113 |
| LOUMS | HAZMAT | MAJOR | 1 | | | | | | 1 |
| | | MEDIUM | 1 | | 1 | | | | 2 |
| | | MINOR | 1 | | | | | | 1 |
| | HAZMAT Total | | 3 | | 1 | | | | 4 |
| | OIL/OILY | MEDIUM | | 1 | | | | 2 | 3 |
| | | MINOR | 26 | 37 | 31 | 19 | 20 | 18 | 151 |
| | | NS | 1 | | | | | 3 | 4 |
| | | POTENT | 1 | | | | | | 1 |
| | OIL/OILY Total | | 28 | 38 | 31 | 19 | 20 | 23 | 159 |
| LOUMS Total | | | 31 | 38 | 32 | 19 | 20 | 23 | 163 |
| HUNMS | HAZMAT | MINOR | 1 | 1 | | 3 | 2 | 1 | 8 |
| | HAZMAT Total | | 1 | 1 | | 3 | 2 | 1 | 8 |
| | OIL/OILY | MAJOR | | | | | 1 | | 1 |
| | | MEDIUM | | | | 2 | 1 | | 3 |
| | | MINOR | 35 | 51 | 10 | 29 | 41 | 8 | 174 |
| | | NS | | | 1 | 1 | | | 2 |
| | | POTENT | | 1 | | 1 | | | 2 |
| | OIL/OILY Total | | 35 | 52 | 11 | 33 | 43 | 8 | 182 |
| HUNMS Total | | | 36 | 53 | 11 | 36 | 45 | 9 | 190 |
| PITMS | HAZMAT | MEDIUM | | | | | 1 | | 1 |
| | | MINOR | 2 | | 1 | 4 | 15 | 4 | 26 |
| | HAZMAT Total | | 2 | | 1 | 4 | 16 | 4 | 27 |
| | OIL/OILY | MEDIUM | 1 | 1 | | | | 1 | 3 |
| | | MINOR | 16 | 18 | 4 | 38 | 55 | 41 | 172 |
| | | NS | 1 | | | 1 | 2 | | 4 |
| | | POTENT | | 2 | | 1 | 2 | 2 | 7 |
| | OIL/OILY Total | | 18 | 21 | 4 | 40 | 59 | 44 | 186 |
| PITMS Total | | | 20 | 21 | 5 | 44 | 75 | 48 | 213 |
| SLMMS | HAZMAT | MINOR | 1 | | | 3 | | 1 | 5 |
| | HAZMAT Total | | 1 | | | 3 | | 1 | 5 |
| | OIL/OILY | MAJOR | | 1 | | | | 1 | 2 |
| | | MEDIUM | 4 | 4 | | 2 | 1 | 4 | 15 |
| | | MINOR | 62 | 67 | 13 | 10 | 12 | 25 | 189 |
| | | NS | 3 | 2 | | 2 | 4 | 2 | 13 |
| | OIL/OILY Total | | 69 | 74 | 13 | 14 | 17 | 32 | 219 |
| SLMMS Total | | | 70 | 74 | 13 | 17 | 17 | 33 | 224 |
| Grand Total | | | 222 | 244 | 84 | 147 | 184 | 128 | 1009 |

| **All WR MSOs #Maj&Med Oil Spills** | **5** | **11** | **2** | **12** | **4** | **8** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Shipped (M-tons) | 20.3499 | 20.7652 | 21.1890 | 14.9620 | 23.3910 | 24.7360 | | | | | |
| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| #Maj&Med Spills per M-tons shipped | 0.25 | 0.53 | 0.09 | 0.80 | 0.17 | 0.32 | | | | | |

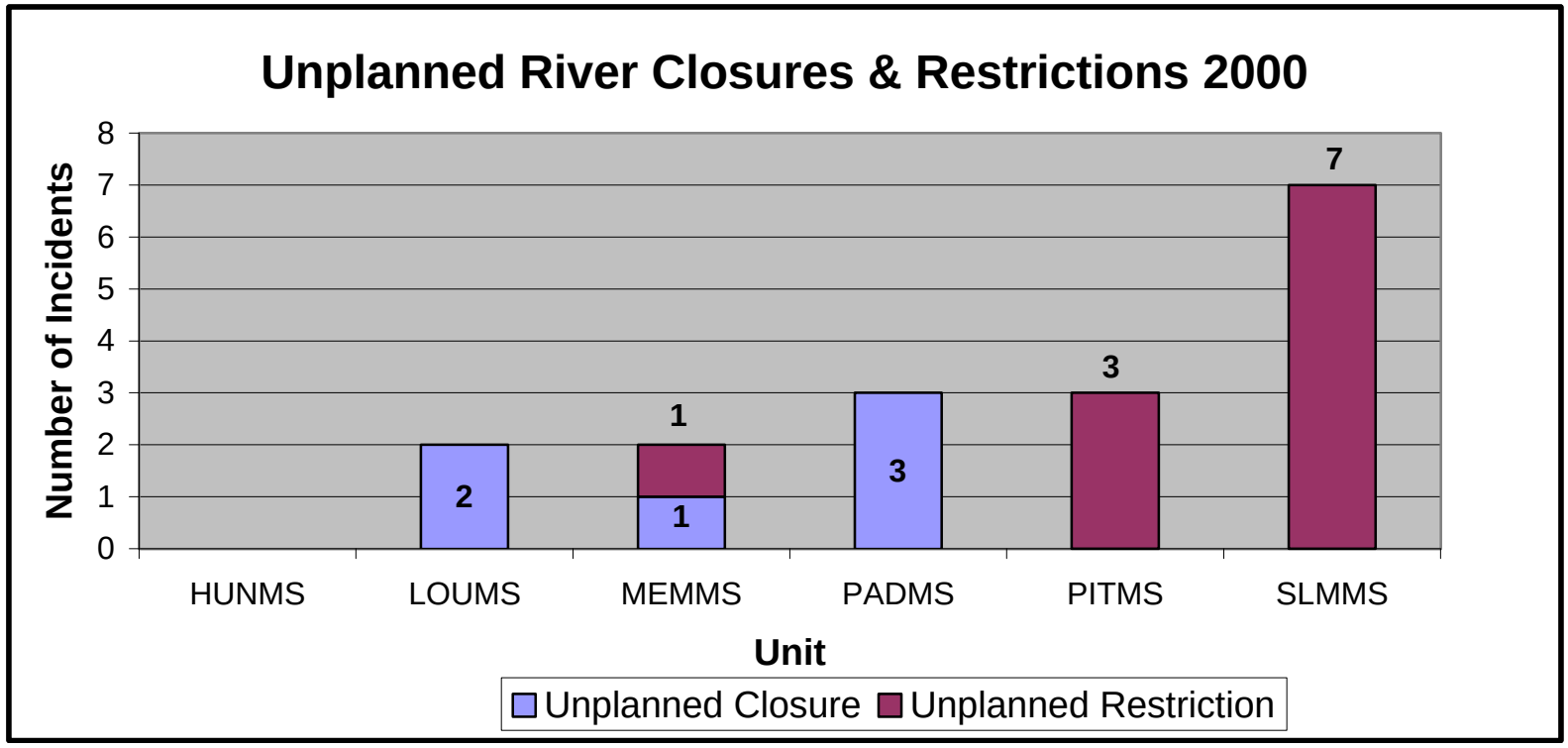
| **All WR MSOs #Maj&Med Hazmat Spills** | **2** | **0** | **1** | **0** | **1** | **0** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Shipped (M-tons) | 24.2670 | 24.2670 | 24.2670 | 24.2690 | 24.8650 | 22.6260 | | | | | |
| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| #Maj&Med Spills per M-tons shipped | 0.08 | 0.00 | 0.04 | 0.00 | 0.04 | 0.00 | | | | | |

| **All WR MSOs #Maj&Med Oil & Hazmat Spills** | **7** | **11** | **3** | **12** | **5** | **8** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Shipped (M-tons) | 44.6169 | 45.0322 | 45.4560 | 39.2310 | 48.2560 | 47.3620 | | | | | |
| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| #Maj&Med Spills per m-tons shipped | 0.157 | 0.244 | 0.066 | 0.306 | 0.104 | 0.169 | 0.145 | 0.145 | 0.145 | 0.145 | 0.145 |

Equals Goal

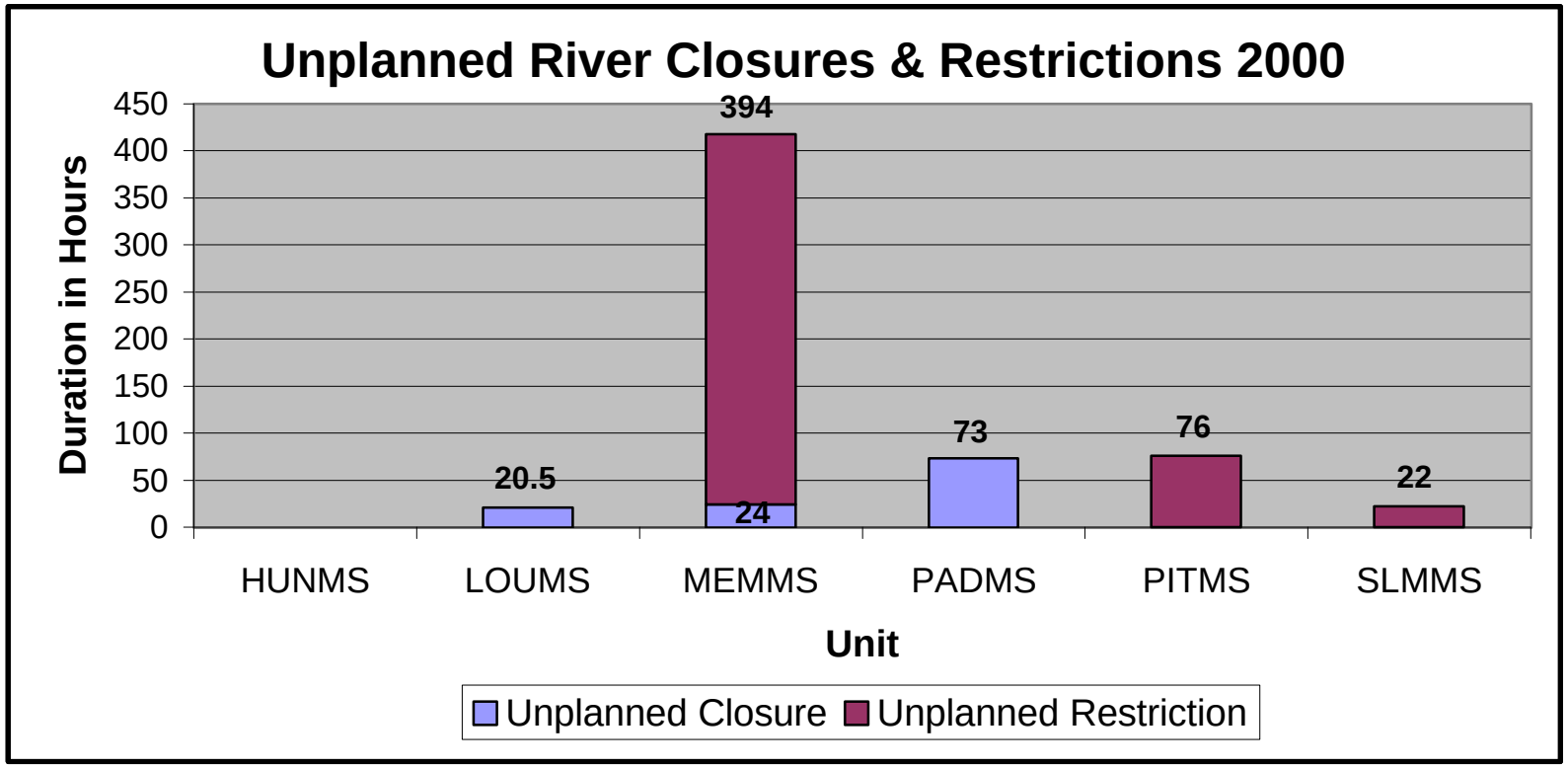
# Appendix 4a

| Count of Category | Year | Category | | | | |
|---|---|---|---|---|---|---|
| | 2000 | | | | 2000 Total | Grand Total |
| Parent Unit | Planned Closure | Unplanned Closure | Unplanned Restriction | Planned Restriction | | |
| HUNMS | 3 | | | | 3 | 3 |
| LOUMS | 11 | 2 | | | 13 | 13 |
| MEMMS | 6 | 1 | 1 | | 8 | 8 |
| PADMS | 8 | 3 | | | 11 | 11 |
| PITMS | 9 | | 3 | 4 | 16 | 16 |
| SLMMS | 7 | | 7 | | 14 | 14 |
| Grand Total | 44 | 6 | 11 | 4 | 65 | 65 |



# Appendix 4b

| Sum of Total Duration | Year | Category | | | | |
|---|---|---|---|---|---|---|
| | 2000 | | | | 2000 Total | Grand Total |
| Parent Unit | Planned Closure | Unplanned Closure | Unplanned Restriction | Planned Restriction | | |
| HUNMS | 26.5 | | | | 26.5 | 26.5 |
| LOUMS | 123.25 | 20.5 | | | 143.75 | 143.75 |
| MEMMS | 7 | 24 | 394 | | 425 | 425 |
| PADMS | 34.5 | 73 | | | 107.5 | 107.5 |
| PITMS | 67 | | 76 | 29 | 172 | 172 |
| SLMMS | 268.5 | | 22 | | 290.5 | 290.5 |
| Grand Total | 526.75 | 117.5 | 492 | 29 | 1165.25 | 1165.25 |



# Appendix 4c

| Count of Description | | Year | |
|---|---|---|---|
| Parent Unit | Description | 2000 | Grand Total |
| HUNMS | Marine Event | 2 | 2 |
| | Bridge Construction/Improvements | 1 | 1 |
| HUNMS Total | | 3 | 3 |
| LOUMS | Structural Failure | 1 | 1 |
| | Marine Event | 9 | 9 |
| | Bridge Construction/Improvements | 2 | 2 |
| | Pollution | 1 | 1 |
| LOUMS Total | | 13 | 13 |
| MEMMS | Low Water | 1 | 1 |
| | Marine Event | 6 | 6 |
| | Sinking | 1 | 1 |
| MEMMS Total | | 8 | 8 |
| PADMS | Grounding | 2 | 2 |
| | Marine Event | 7 | 7 |
| | Allision | 2 | 2 |
| PADMS Total | | 11 | 11 |
| PITMS | Grounding | 1 | 1 |
| | Marine Event | 11 | 11 |
| | Sinking | 1 | 1 |
| | Fire | 1 | 1 |
| | Cable or Pipeline Work | 2 | 2 |
| PITMS Total | | 16 | 16 |
| SLMMS | Grounding | 4 | 4 |
| | Structural Failure | 1 | 1 |
| | Marine Event | 4 | 4 |
| | Fire | 1 | 1 |
| | Dredging | 3 | 3 |
| | Allision | 1 | 1 |
| SLMMS Total | | 14 | 14 |
| Grand Total | | 65 | 65 |

| Count of Cause | | Year | Cause | | |
|---|---|---|---|---|---|
| | | 2000 | | 2000 Total | Grand Total |
| Parent Unit | Category | Environmental | Human | | |
| LOUMS | Unplanned Closure | 1 | 1 | 2 | 2 |
| LOUMS Total | | 1 | 1 | 2 | 2 |
| MEMMS | Unplanned Closure | 1 | | 1 | 1 |
| | Unplanned Restriction | 1 | | 1 | 1 |
| MEMMS Total | | 2 | | 2 | 2 |
| PADMS | Unplanned Closure | | 3 | 3 | 3 |
| PADMS Total | | | 3 | 3 | 3 |
| PITMS | Unplanned Restriction | 2 | 1 | 3 | 3 |
| PITMS Total | | 2 | 1 | 3 | 3 |
| SLMMS | Unplanned Restriction | 1 | 6 | 7 | 7 |
| SLMMS Total | | 1 | 6 | 7 | 7 |
| Grand Total | | 6 | 11 | 17 | 17 |

# Appendix 5a

**Marine Casualties**

| Calendar Year | | 2000 Casualties | 1999 Casualties | 1998 Casualties | 1997 Casualties | 1996 Casualties | 1995 Casualties | 1994 Casualties | TOTAL Casualties |
|---|---|---|---|---|---|---|---|---|---|
| Port | Casualty Type | Sum | Sum | Sum | Sum | Sum | Sum | Sum | Sum |
| MSD CINCINNATI | ALLISION | 9 | 1 | 7 | 2 | 6 | 2 | . | 27 |
| | COLLISION | . | 2 | . | 1 | 1 | . | . | 4 |
| | EQUIP FAIL | . | 2 | . | 5 | . | . | . | 7 |
| | GROUNDING | 4 | 2 | 4 | . | 2 | 2 | . | 14 |
| | TOTAL | 13 | 7 | 11 | 8 | 9 | 4 | . | 52 |
| MSD DAVENPORT | ALLISION | 2 | 42 | 34 | 28 | 14 | 9 | 2 | 131 |
| | COLLISION | . | 1 | 5 | . | 1 | 7 | . | 14 |
| | EQUIP FAIL | . | 1 | 3 | . | 1 | 6 | . | 11 |
| | GROUNDING | 4 | 18 | 15 | . | 4 | 42 | 6 | 89 |
| | SINKING | . | 1 | . | . | . | . | . | 1 |
| | TOTAL | 6 | 63 | 57 | 28 | 20 | 64 | 8 | 246 |
| MSD GREENVILLE | ALLISION | 1 | . | 5 | 4 | 1 | 3 | . | 14 |
| | COLLISION | . | . | . | . | 2 | . | . | 2 |
| | GROUNDING | 1 | . | 13 | . | 3 | 2 | . | 19 |
| | TOTAL | 2 | . | 18 | 4 | 6 | 5 | . | 35 |
| MSD MINNEAPOLIS/ST.PAUL | ALLISION | . | 13 | 15 | 8 | 16 | 18 | 3 | 73 |
| | COLLISION | . | 6 | 1 | 1 | 2 | 1 | . | 11 |
| | EQUIP FAIL | . | . | 1 | 2 | . | . | . | 3 |
| | GROUNDING | . | 30 | 22 | 10 | 11 | 47 | 2 | 122 |
| | TOTAL | . | 49 | 39 | 21 | 29 | 66 | 5 | 209 |
| MSD NASHVILLE | ALLISION | 4 | 4 | 3 | . | . | . | . | 11 |
| | COLLISION | . | 1 | . | . | . | . | . | 1 |
| | EQUIP FAIL | . | 1 | 1 | . | . | . | . | 2 |
| | GROUNDING | 10 | 13 | 2 | 1 | . | . | . | 26 |
| | TOTAL | 14 | 19 | 6 | 1 | . | . | . | 40 |
| MSD PEORIA | ALLISION | . | 12 | 34 | 15 | 21 | 4 | . | 86 |
| | COLLISION | 2 | 1 | . | 1 | . | . | . | 4 |
| | EQUIP FAIL | . | 1 | 1 | . | 1 | . | . | 3 |
| | GROUNDING | 3 | 20 | 14 | 6 | 69 | 55 | 25 | 192 |
| | TOTAL | 5 | 34 | 49 | 22 | 91 | 59 | 25 | 285 |
| MSO HUNTINGTON | ALLISION | . | 1 | 9 | 6 | 18 | 8 | . | 42 |
| | COLLISION | 1 | 12 | 2 | 4 | 3 | . | . | 22 |
| | EQUIP FAIL | . | . | 2 | 2 | 2 | . | . | 6 |
| | GROUNDING | 1 | 3 | 18 | 17 | 11 | 4 | . | 54 |
| | SINKING | . | . | . | . | 1 | . | . | 1 |
| | TOTAL | 2 | 16 | 31 | 29 | 35 | 12 | . | 125 |
| MSO LOUISVILLE | ALLISION | 3 | 5 | 9 | 10 | 19 | 7 | 2 | 55 |
| | COLLISION | . | 3 | 4 | 2 | 4 | 5 | . | 18 |
| | EQUIP FAIL | . | . | 3 | 1 | 1 | 2 | . | 7 |
| | GROUNDING | 13 | 27 | 65 | 17 | 24 | 21 | . | 167 |
| | TOTAL | 16 | 35 | 81 | 30 | 48 | 35 | 2 | 247 |
| MSO MEMPHIS | ALLISION | . | 7 | 20 | 12 | 22 | 19 | 1 | 81 |
| | CAPSIZE | . | . | . | . | 1 | . | . | 1 |
| | COLLISION | . | 8 | 3 | 11 | 15 | 6 | 2 | 45 |
| | EQUIP FAIL | . | 5 | . | 5 | 2 | 4 | . | 16 |
| | GROUNDING | 4 | 47 | 52 | 69 | 63 | 97 | 39 | 371 |
| | SINKING | . | 1 | . | . | 1 | . | . | 2 |
| | TOTAL | 4 | 68 | 75 | 97 | 104 | 126 | 42 | 516 |
| MSO PADUCAH | ALLISION | 26 | 35 | 42 | 40 | 41 | 49 | 8 | 241 |
| | CAPSIZE | . | . | . | . | . | 1 | . | 1 |
| | COLLISION | 19 | 13 | 29 | 14 | 21 | 3 | 1 | 100 |
| | EQUIP FAIL | . | 3 | 2 | 3 | 5 | 4 | . | 17 |
| | FIRE | 1 | . | . | . | . | . | . | 1 |
| | FLOODING | . | 5 | . | 1 | . | . | . | 6 |
| | GROUNDING | 27 | 98 | 81 | 165 | 99 | 129 | 29 | 628 |
| | SINKING | . | 2 | . | 1 | 1 | . | . | 4 |
| | TOTAL | 73 | 156 | 154 | 224 | 167 | 186 | 38 | 998 |
| MSO PITTSBURG | ALLISION | 10 | 14 | . | 3 | 5 | 2 | 4 | 38 |
| | COLLISION | 2 | 4 | 1 | . | 2 | 2 | . | 11 |
| | FLOODING | . | . | . | . | 1 | . | . | 1 |
| | GROUNDING | 4 | 8 | . | 4 | . | 3 | . | 19 |
| | SINKING | . | . | . | . | . | . | 1 | 1 |
| | TOTAL | 16 | 26 | 1 | 7 | 8 | 7 | 5 | 70 |
| MSO ST. LOUIS | ALLISION | 6 | 24 | 31 | 29 | 9 | 19 | 2 | 120 |
| | COLLISION | 2 | 9 | 4 | 9 | 7 | 5 | 1 | 37 |
| | EQUIP FAIL | . | 5 | 13 | 5 | 5 | . | . | 28 |
| | GROUNDING | 15 | 47 | 36 | 23 | 22 | 31 | 3 | 177 |
| | SINKING | . | . | . | 1 | 2 | . | . | 3 |
| | TOTAL | 23 | 85 | 84 | 67 | 45 | 55 | 6 | 365 |
| TOTAL | ALLISION | 61 | 158 | 209 | 157 | 172 | 140 | 22 | 919 |
| | CAPSIZE | . | . | . | . | 1 | 1 | . | 2 |
| | COLLISION | 26 | 60 | 49 | 43 | 58 | 29 | 4 | 269 |
| | EQUIP FAIL | . | 18 | 26 | 23 | 17 | 16 | . | 100 |
| | FIRE | 1 | . | . | . | . | . | . | 1 |
| | FLOODING | . | 5 | . | 1 | 1 | . | . | 7 |
| | GROUNDING | 86 | 313 | 322 | 312 | 308 | 433 | 104 | 1878 |
| | SINKING | . | 4 | . | 2 | 5 | . | 1 | 12 |
| | TOTAL | 174 | 558 | 606 | 538 | 562 | 619 | 131 | 3188 |

**Appendix 5 - Marine Casualties (excluding personnel & pollution cases)**

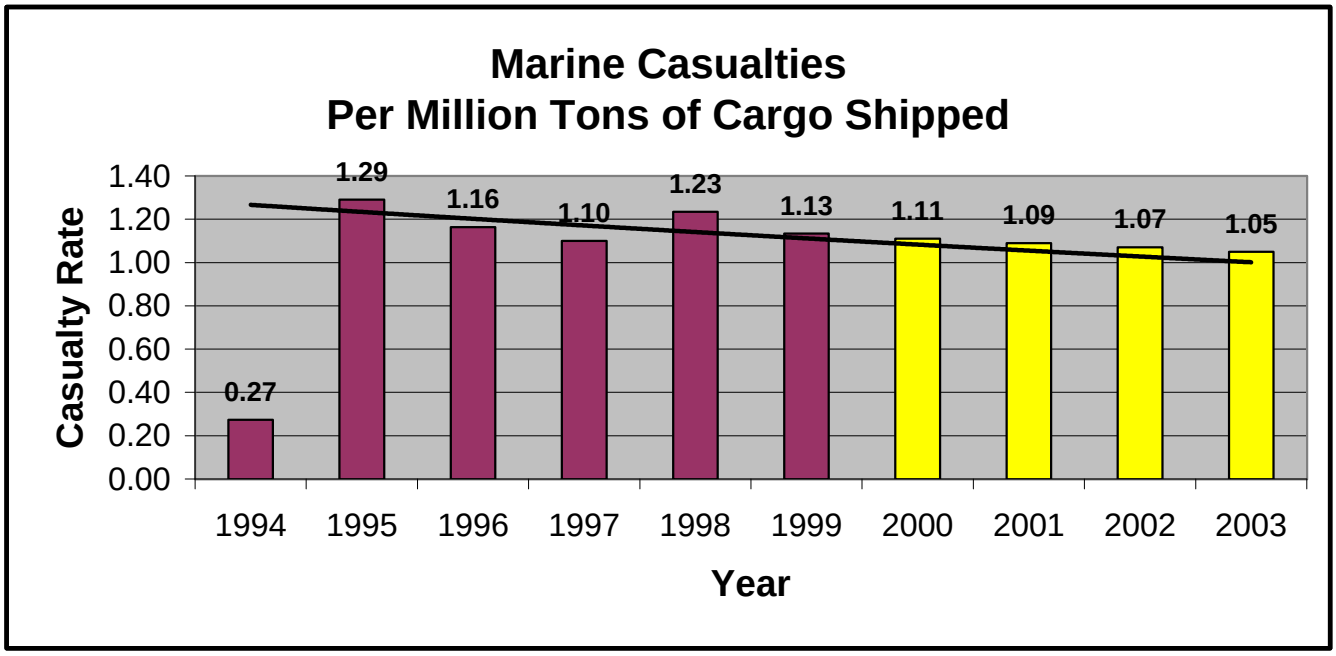
# Appendix 5b

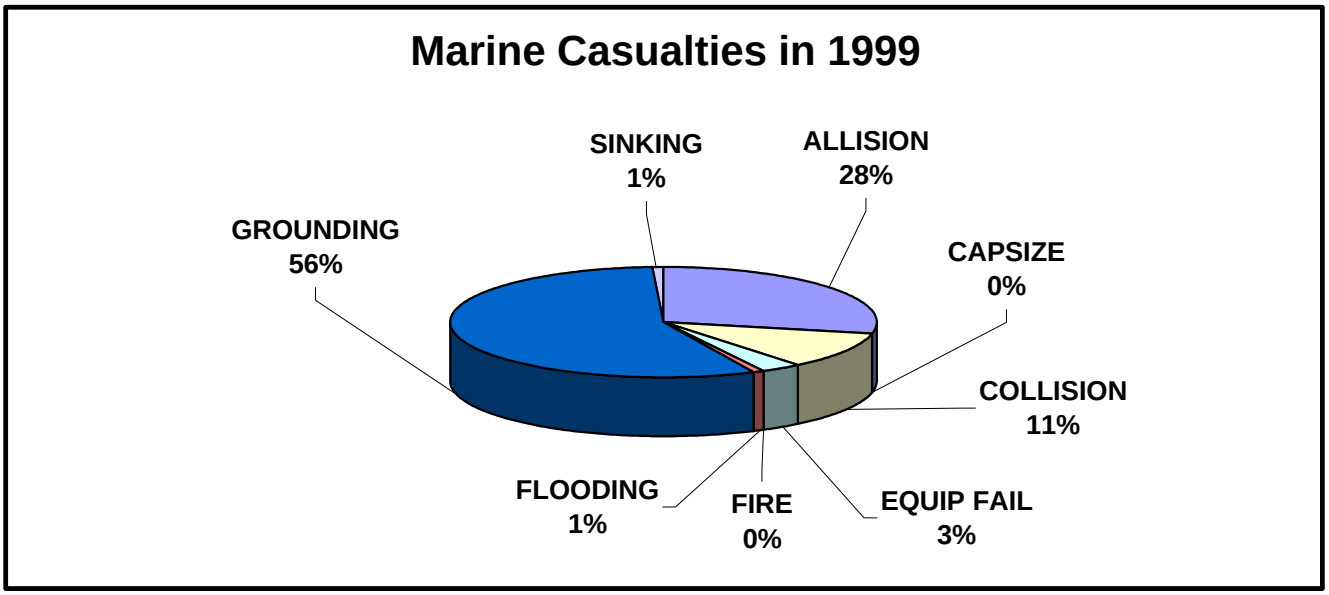
| Marine Casualties | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of Casualties | 131 | 619 | 562 | 538 | 606 | 558 | 174 | | | |
| Million Tons of Cargo Shipped | 480 | 479 | 483 | 489 | 491 | 492 | 494 | | | |

*estimated

| Marine Casualties | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Casualties Per Million Tons of Cargo Shipped | 0.27 | 1.29 | 1.16 | 1.10 | 1.23 | 1.13 | 1.11 | 1.09 | 1.07 | 1.05 |

* goal

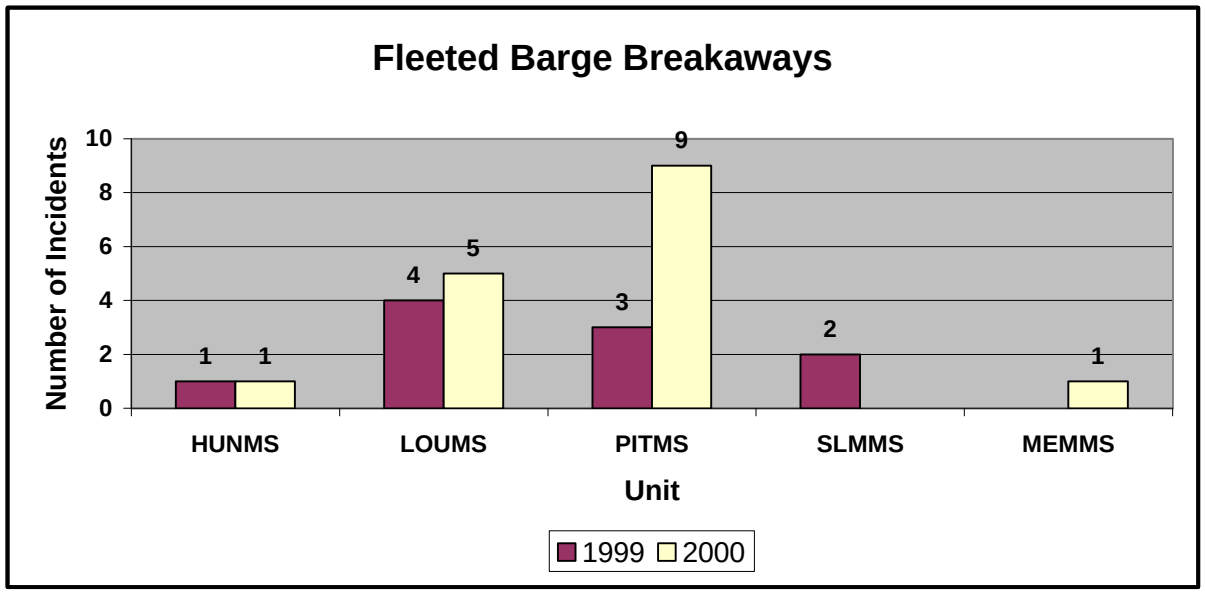


# Appendix 6a

| Count of Description | | Year | | |
|---|---|---|---|---|
| Parent Unit | Description | 1999 | 2000 | Grand Total |
| HUNMS | Procedural | 1 | | 1 |
| | Intentional/Sabatoge | | 1 | 1 |
| HUNMS Total | | 1 | 1 | 2 |
| LOUMS | Ice | 1 | | 1 |
| | Procedural | 2 | 1 | 3 |
| | LineFailure | | 2 | 2 |
| | Wind | 1 | | 1 |
| | HighWater | | 2 | 2 |
| LOUMS Total | | 4 | 5 | 9 |
| PITMS | Procedural | 2 | | 2 |
| | Equip'tFailure | 1 | 9 | 10 |
| PITMS Total | | 3 | 9 | 12 |
| SLMMS | Procedural | 1 | | 1 |
| | LineFailure | 1 | | 1 |
| SLMMS Total | | 2 | | 2 |
| MEMMS | Allision | | 1 | 1 |
| MEMMS Total | | | 1 | 1 |
| Grand Total | | 10 | 16 | 26 |

| Count of Cause | Year | Cause | | | | | |
|---|---|---|---|---|---|---|---|
| | 1999 | | 1999 Total | 2000 | | 2000 Total | Grand Total |
| Parent Unit | Environmental | Human | | Environmental | Human | | |
| HUNMS | | 1 | 1 | | 1 | 1 | 2 |
| LOUMS | 2 | 2 | 4 | 2 | 3 | 5 | 9 |
| MEMMS | | | | 1 | | 1 | 1 |
| PITMS | | 3 | 3 | | 9 | 9 | 12 |
| SLMMS | | 2 | 2 | | | | 2 |
| Grand Total | 2 | 8 | 10 | 3 | 13 | 16 | 26 |



# Appendix 6b

| Sum of #Barges that Broke Free | Year | Cause | | | | | |
|---|---|---|---|---|---|---|---|
| | 1999 | | 1999 Total | 2000 | | 2000 Total | Grand Total |
| Parent Unit | Environmental | Human | | Environmental | Human | | |
| HUNMS | | 2 | 2 | | 2 | 2 | 4 |
| LOUMS | 4 | 7 | 11 | 9 | 10 | 19 | 30 |
| MEMMS | | | | 22 | | 22 | 22 |
| PITMS | | 23 | 23 | | 16 | 16 | 39 |
| SLMMS | | 12 | 12 | | | | 12 |
| Grand Total | 4 | 44 | 48 | 31 | 28 | 59 | 107 |